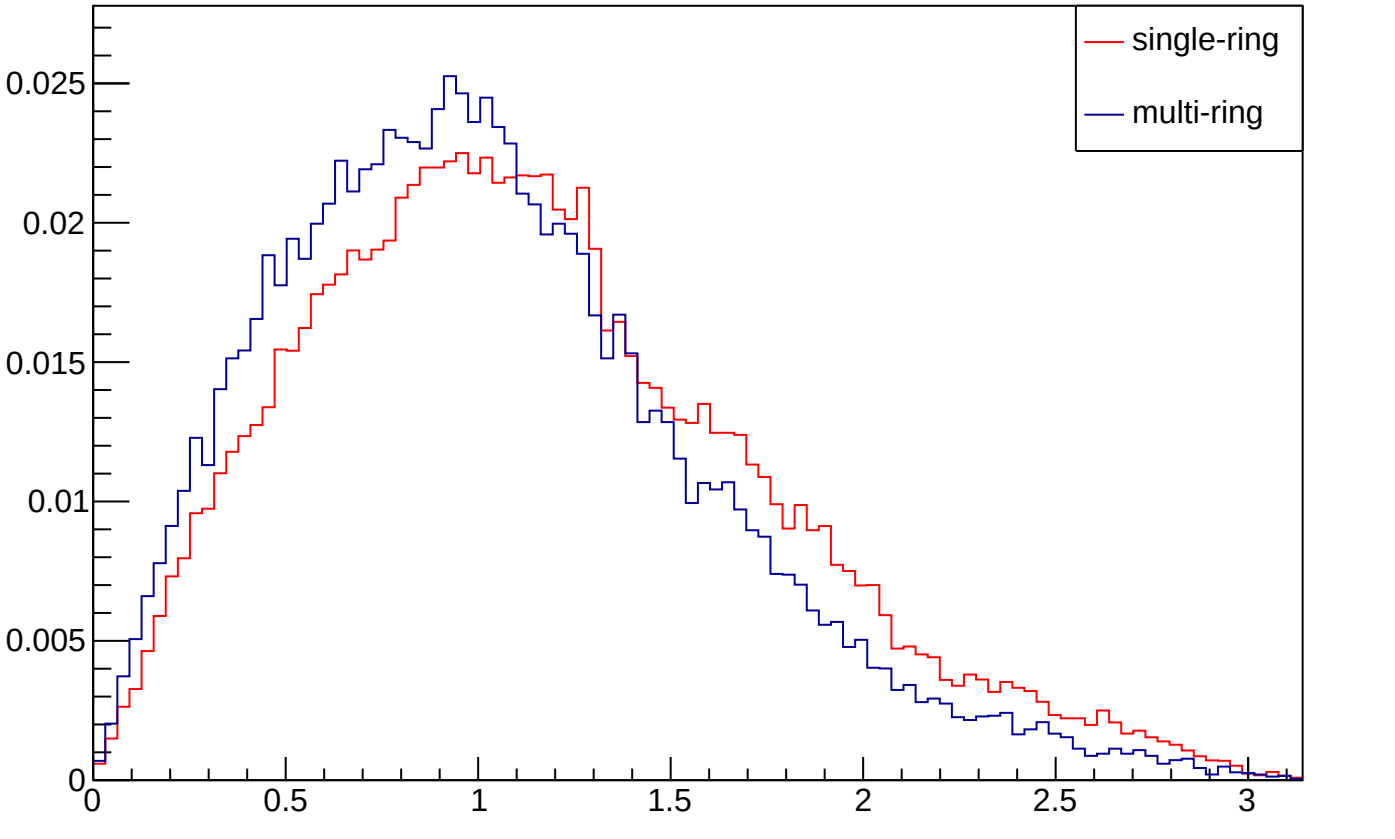
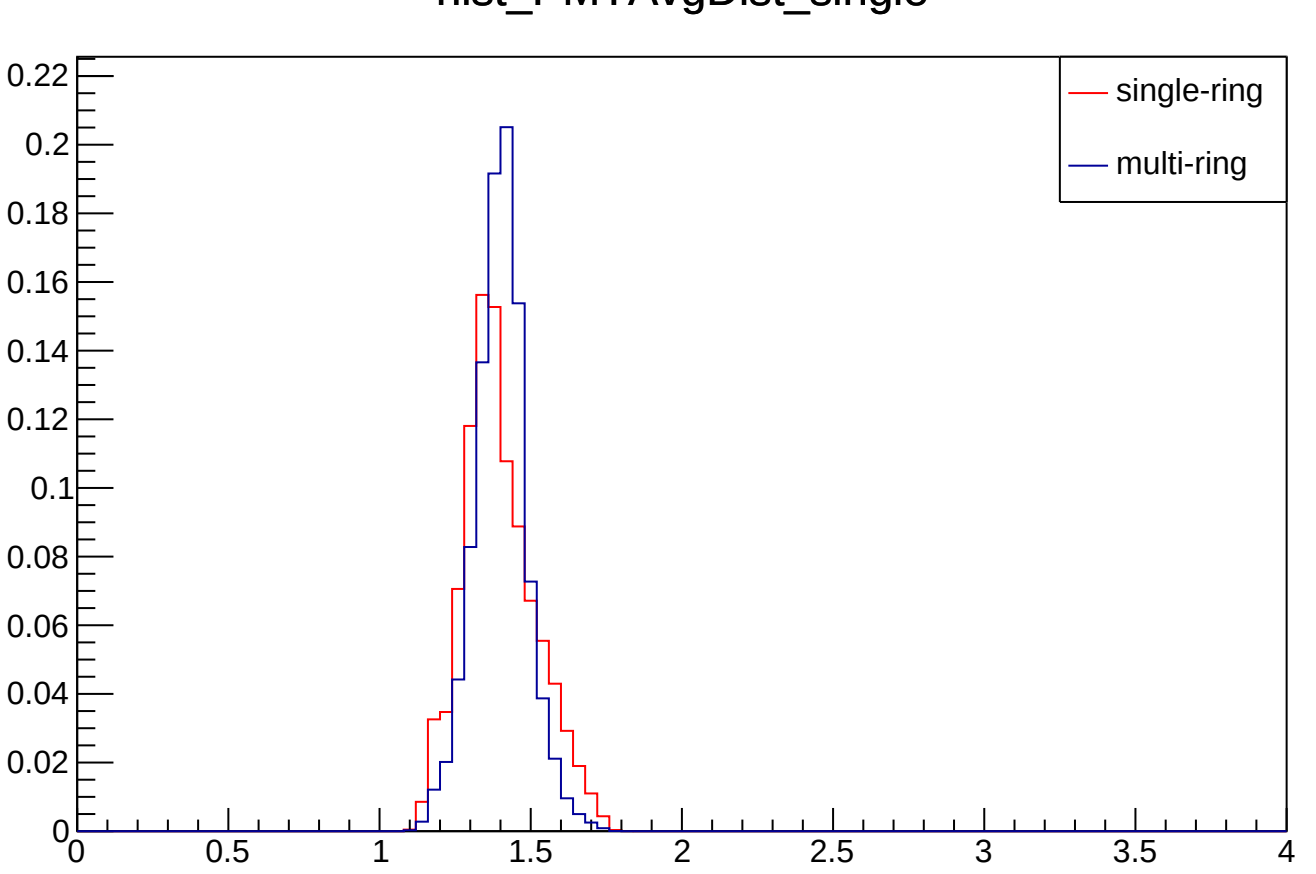
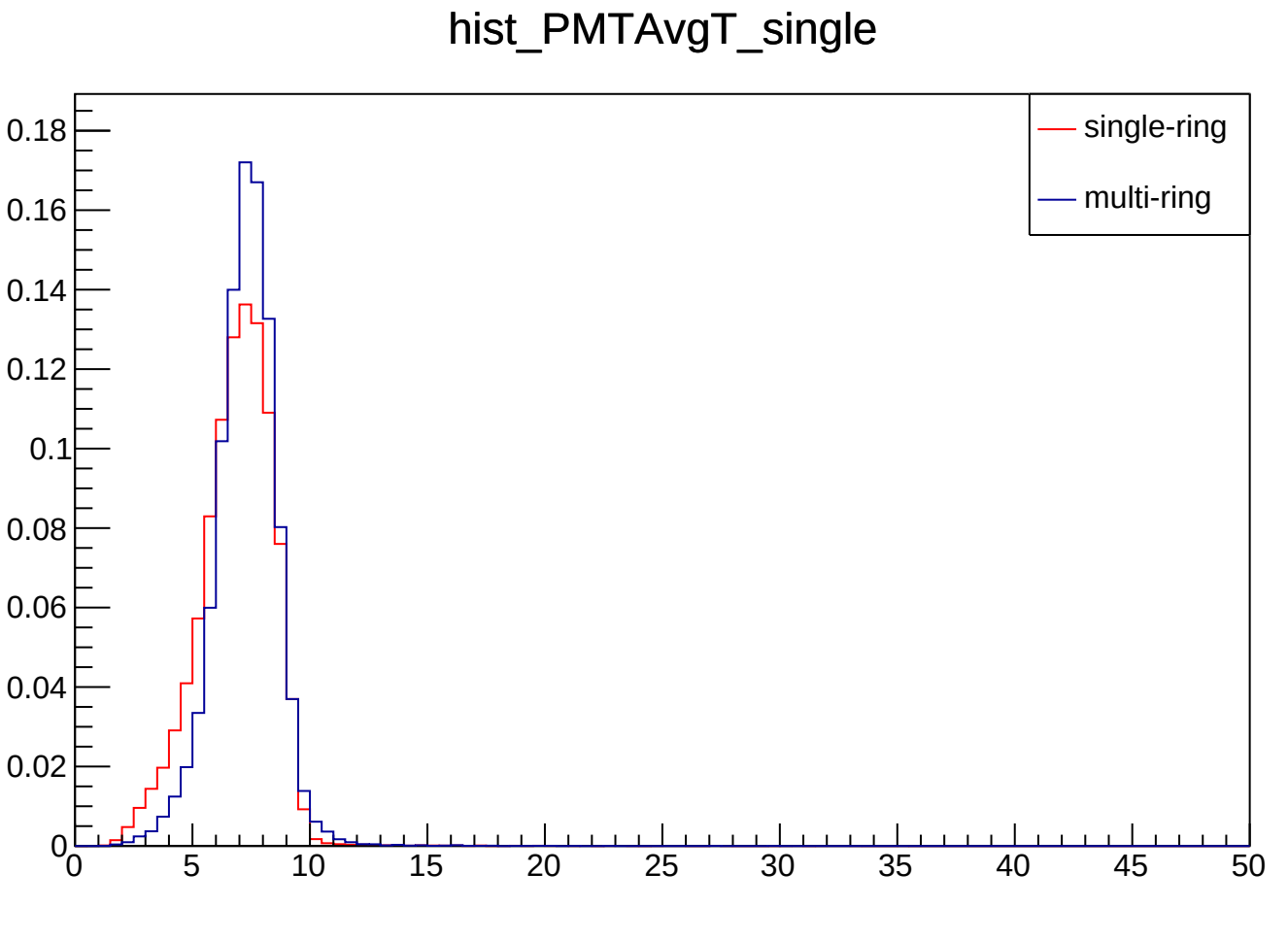
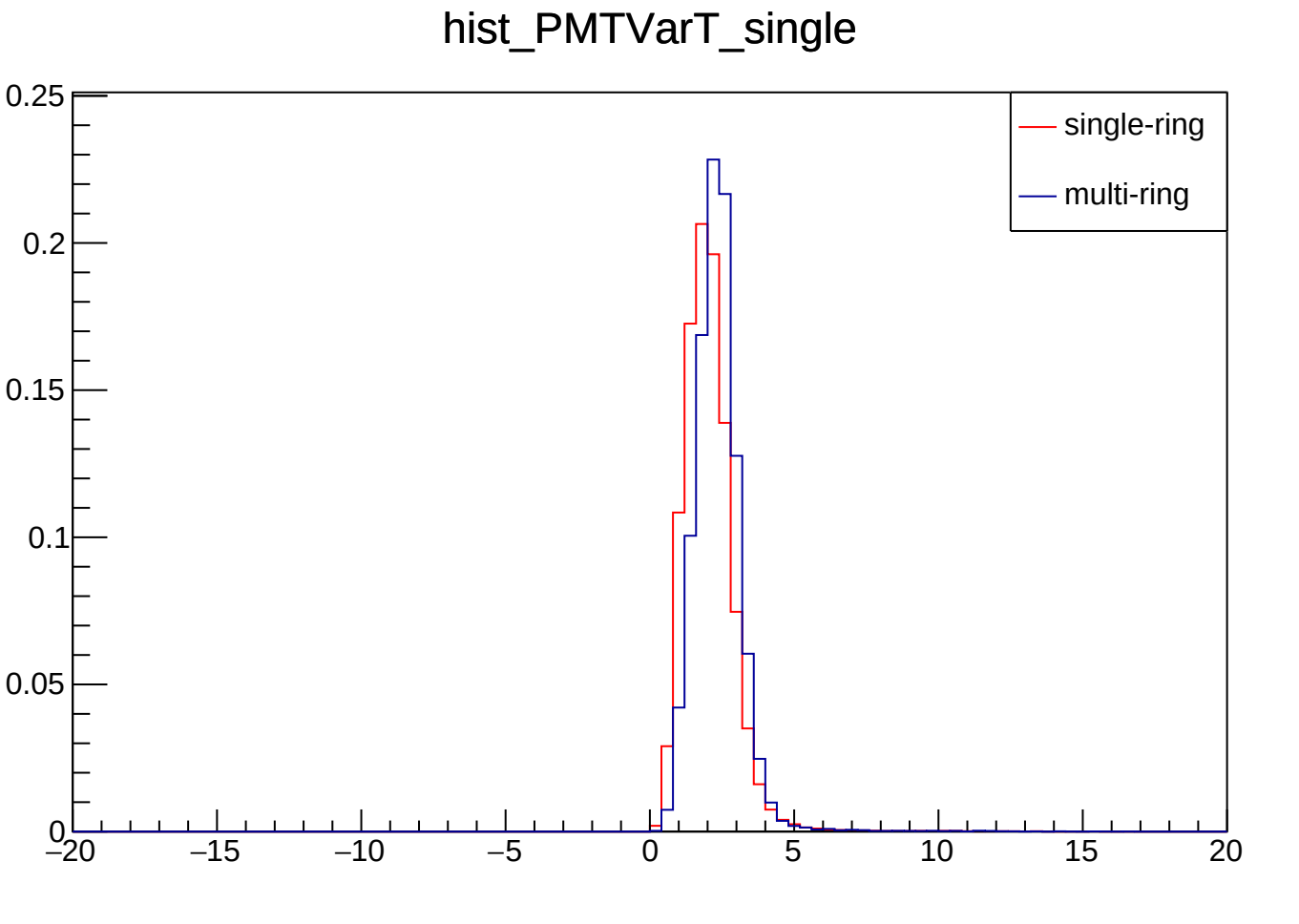
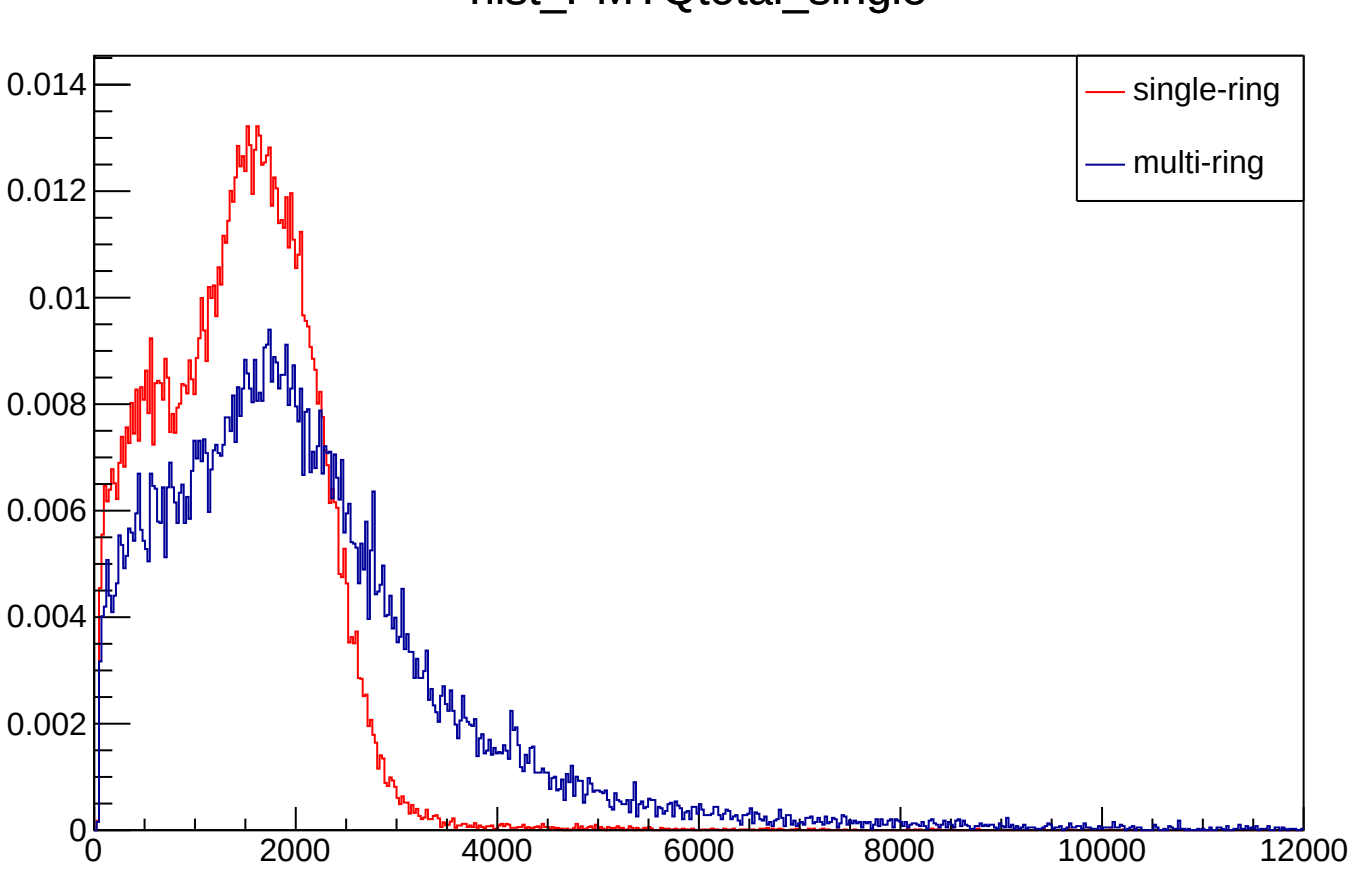
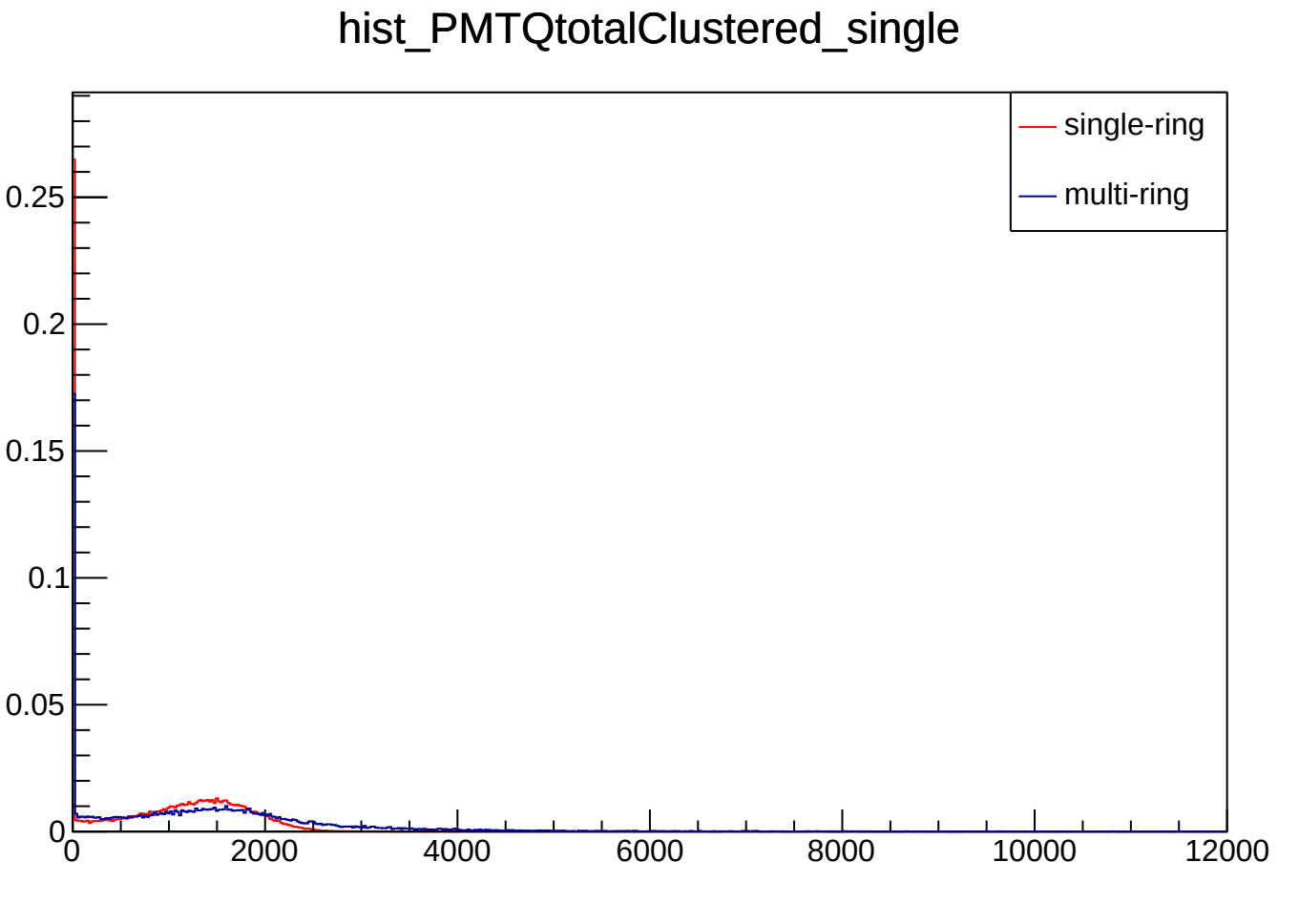

hist_PMTBaryTheta_single
single-ring
multi-ring
0.025
0.02
0.015
0.01
0.005
0
0
0.5
1
1.5
2
2.5
3

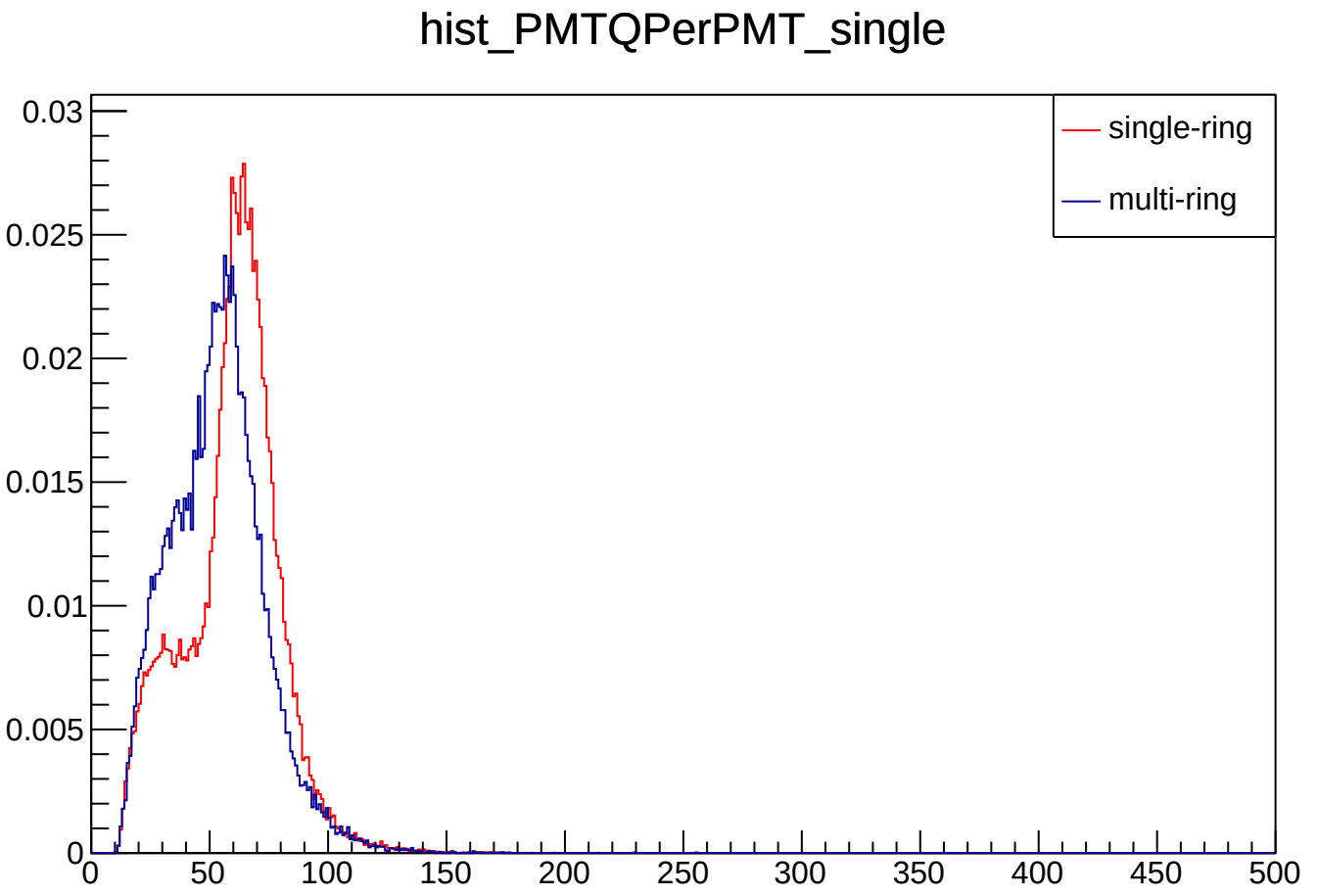

hist_PMTAvgDist_single
single-ring
multi-ring
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3
3.5
4

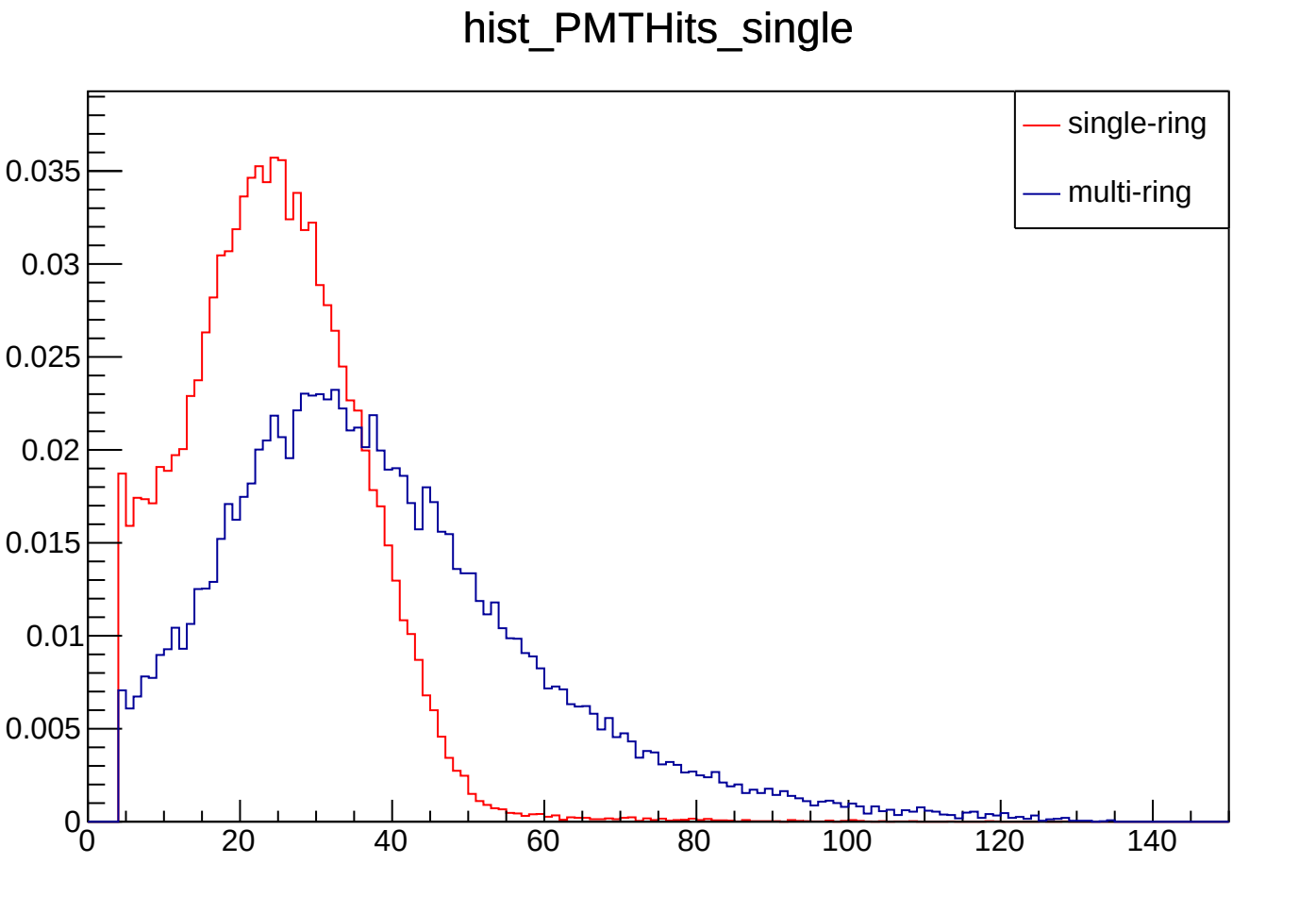

hist_PMTAvgT_single
single-ring
multi-ring
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
5
10
15
20
25
30
35
40
45
50

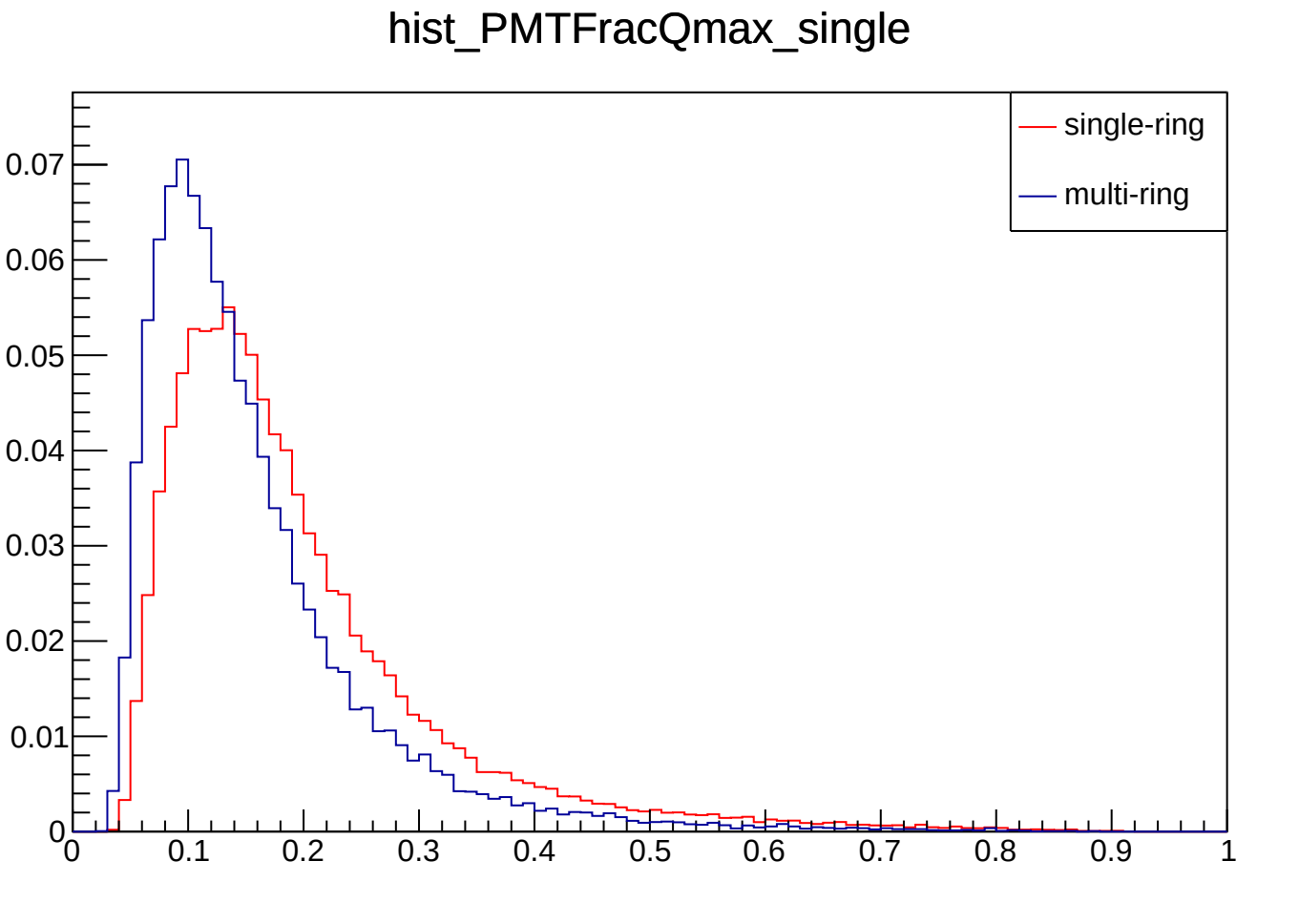

hist_PMTVarT_single
single-ring
multi-ring
0.25
0.2
0.15
0.1
0.05
0
−20
−15
−10
−5
0
5
10
15
20

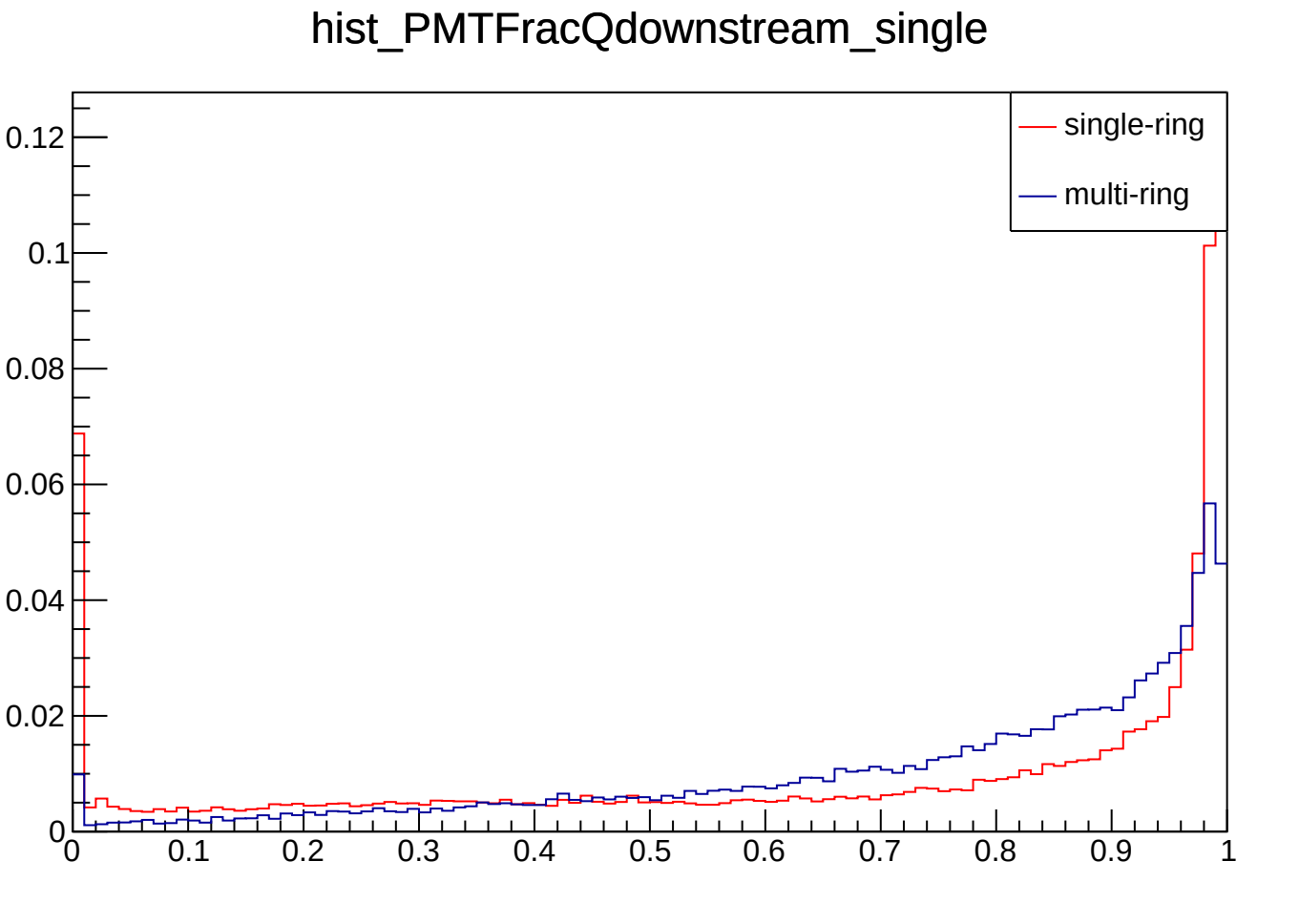

hist_PMTQtotal_single
single-ring
multi-ring
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
0
2000
4000
6000
8000
10000
12000

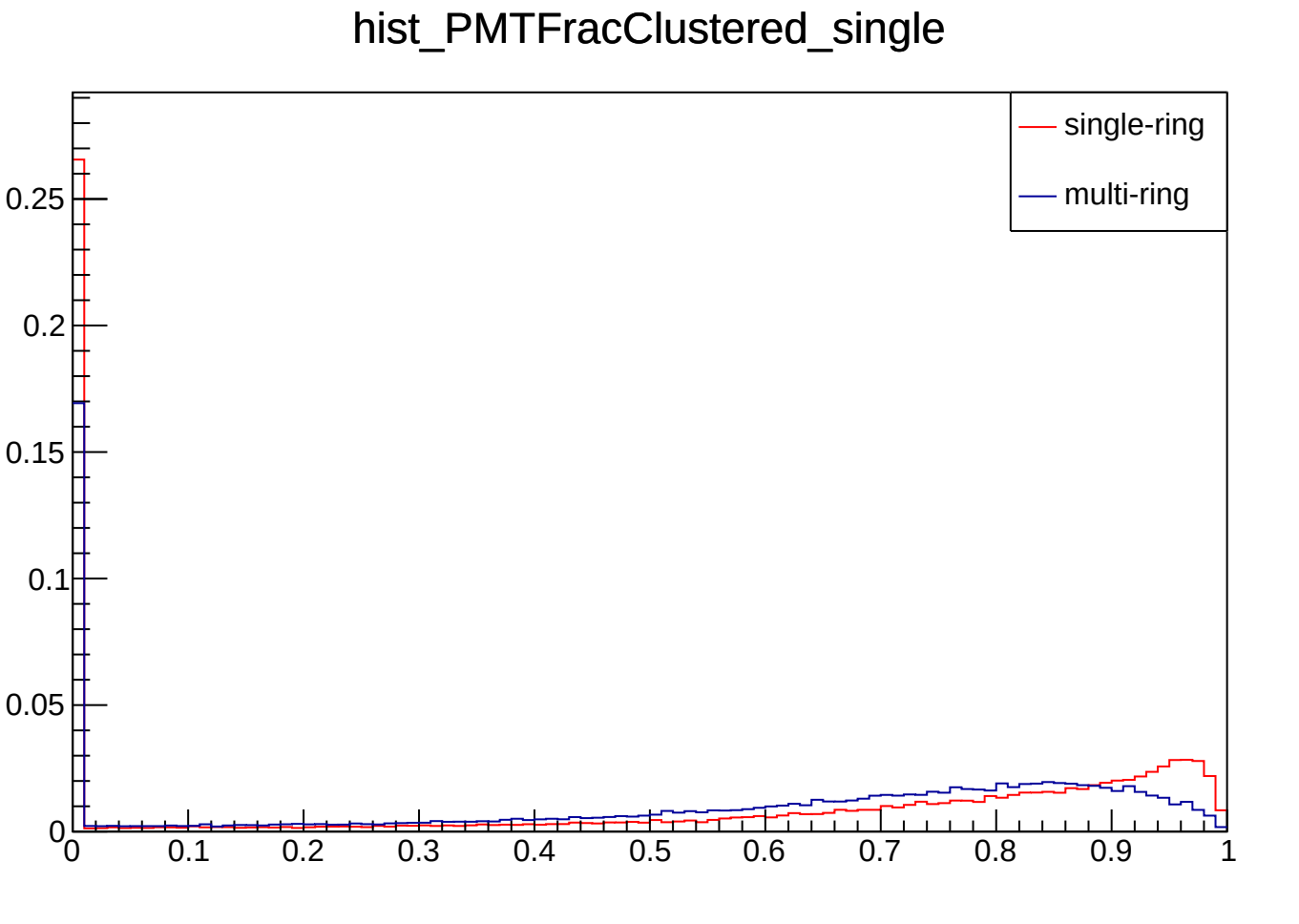

hist_PMTQtotalClustered_single
single-ring
multi-ring
0.25
0.2
0.15
0.1
0.05
0
0
2000
4000
6000
8000
10000
12000

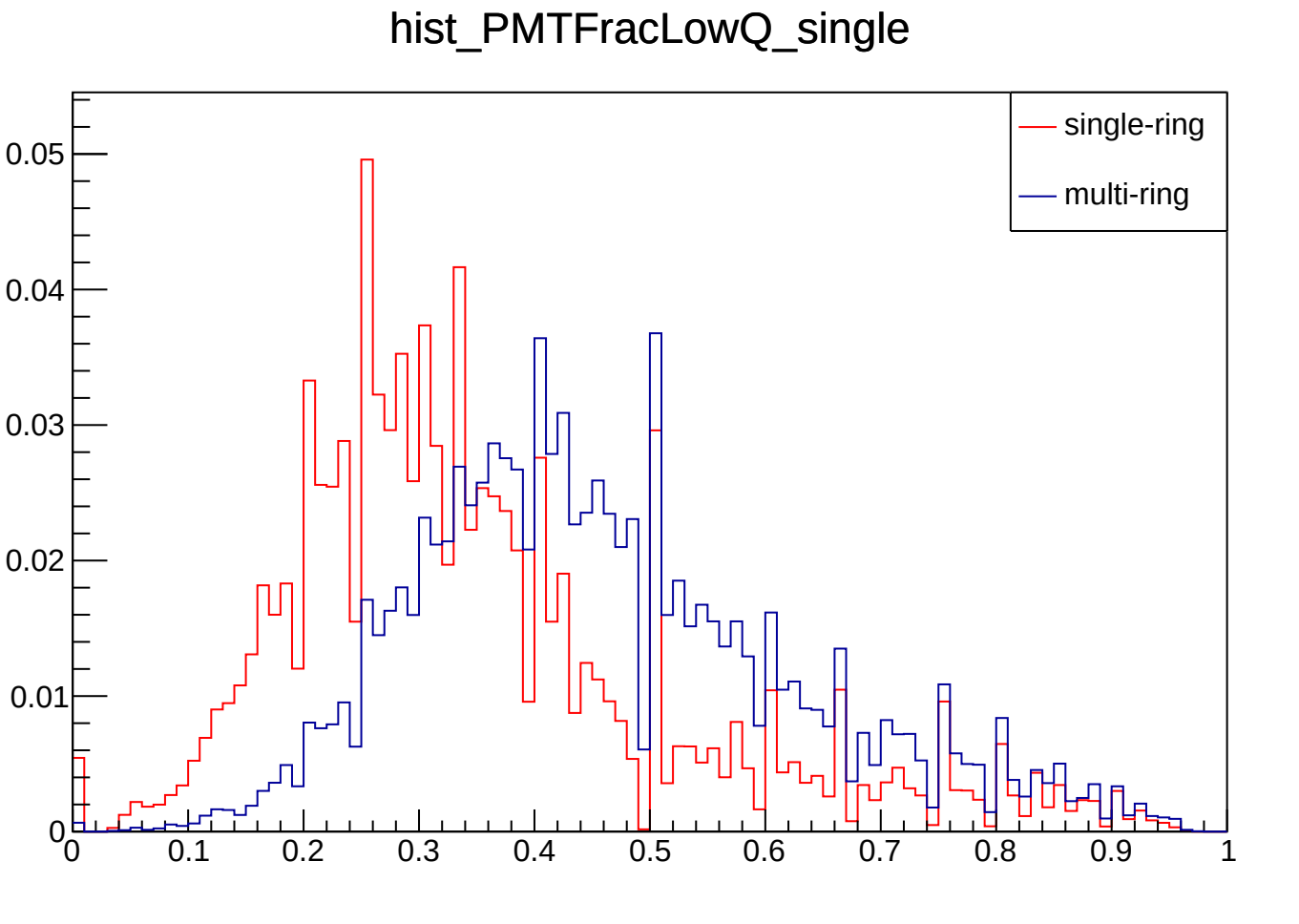

hist_PMTQPerPMT_single
single-ring
multi-ring
0.03
0.025
0.02
0.015
0.01
0.005
0
0
50
100
150
200
250
300
350
400
450
500

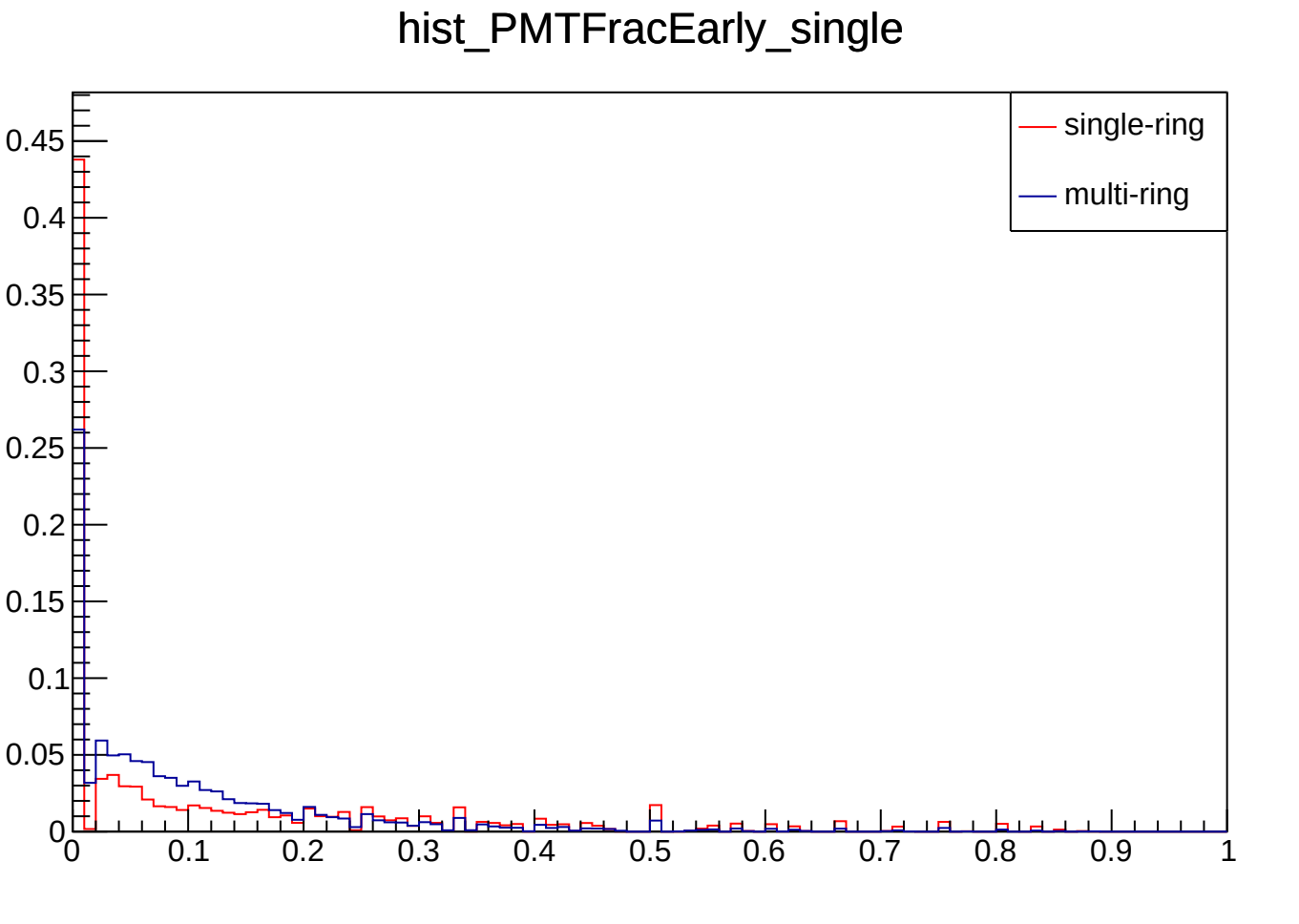

hist_PMTHits_single
single-ring
multi-ring
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
20
40
60
80
100
120
140

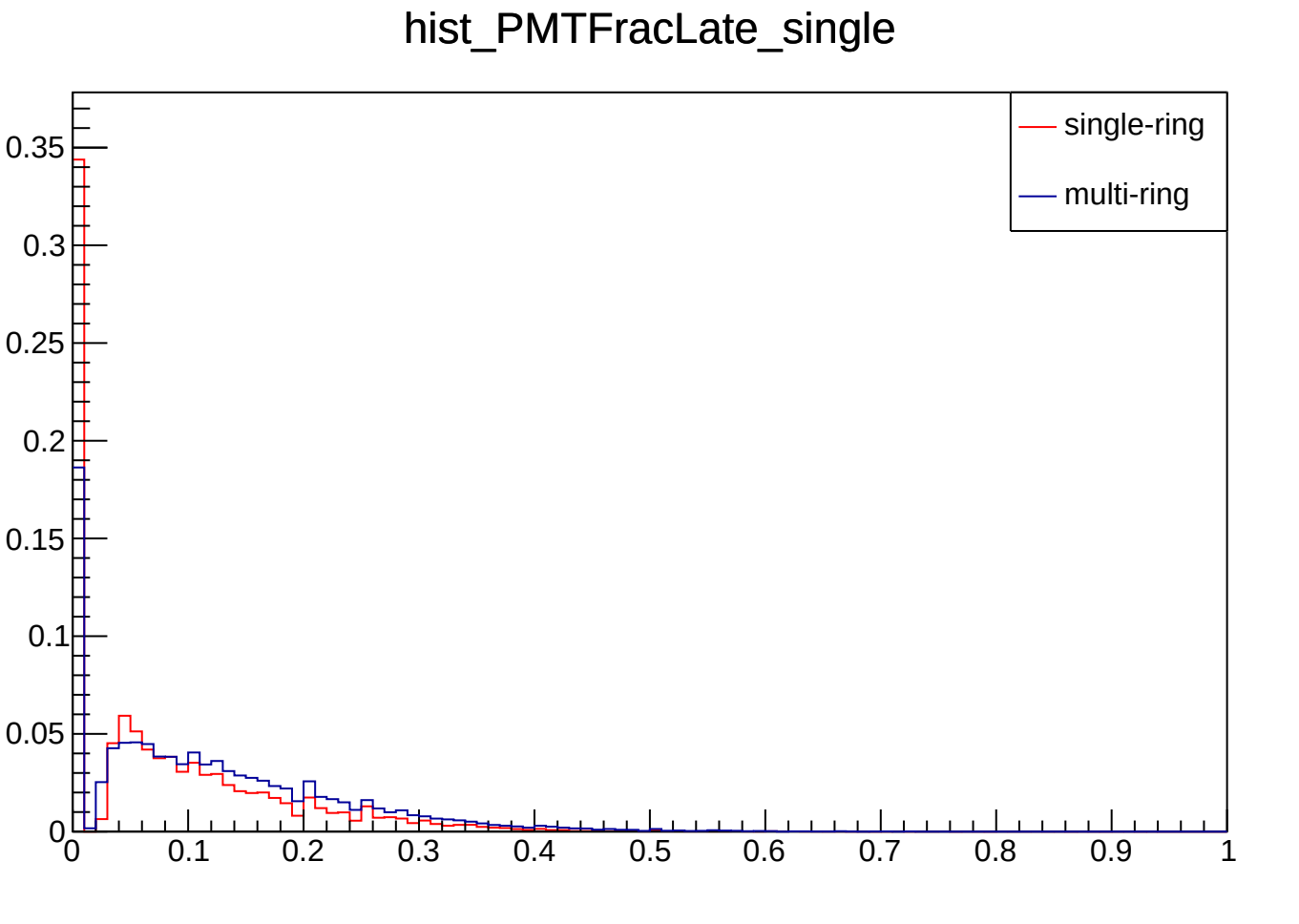

hist_PMTFracQmax_single
single-ring
multi-ring
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

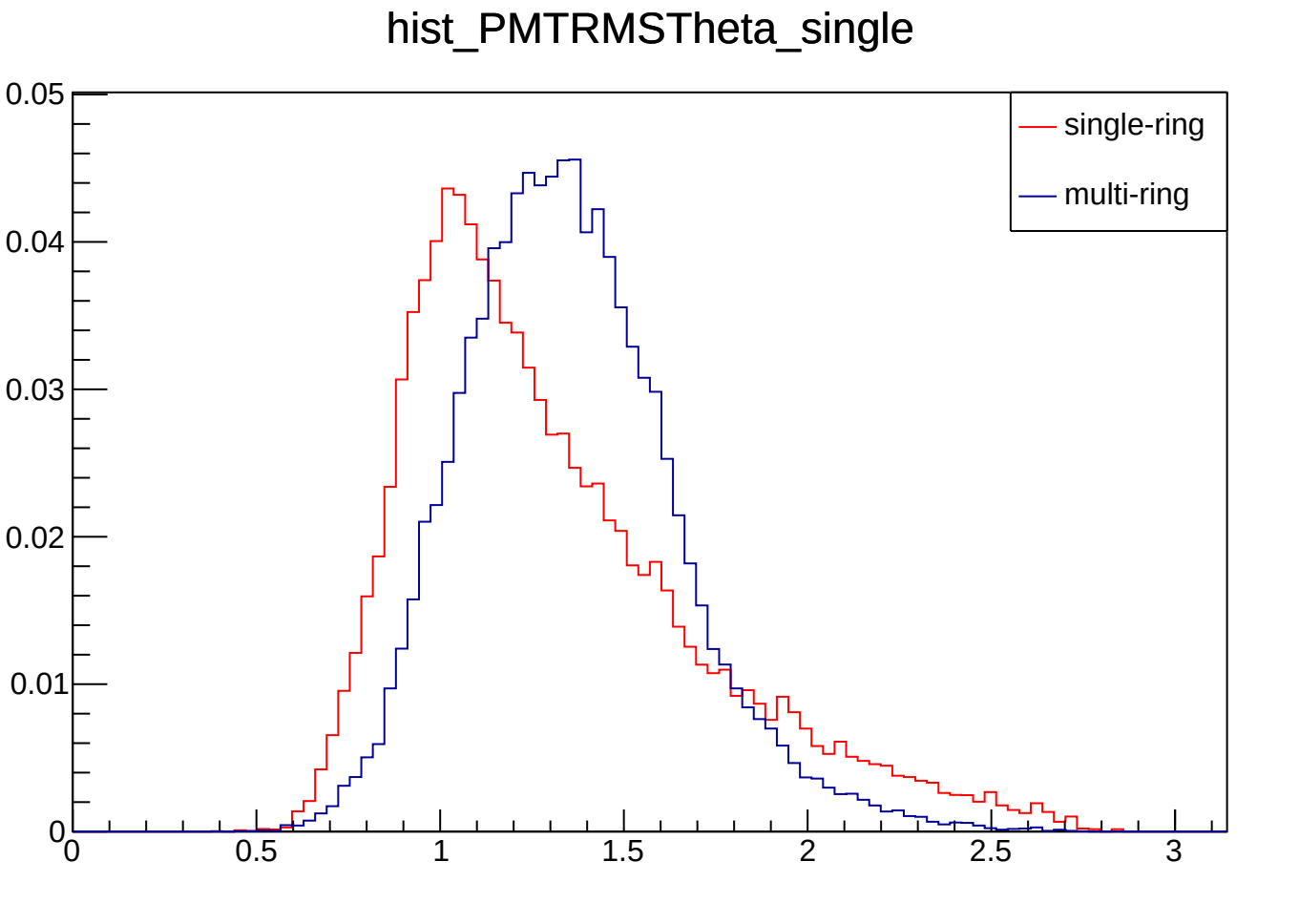

hist_PMTFracQdownstream_single
single-ring
multi-ring
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

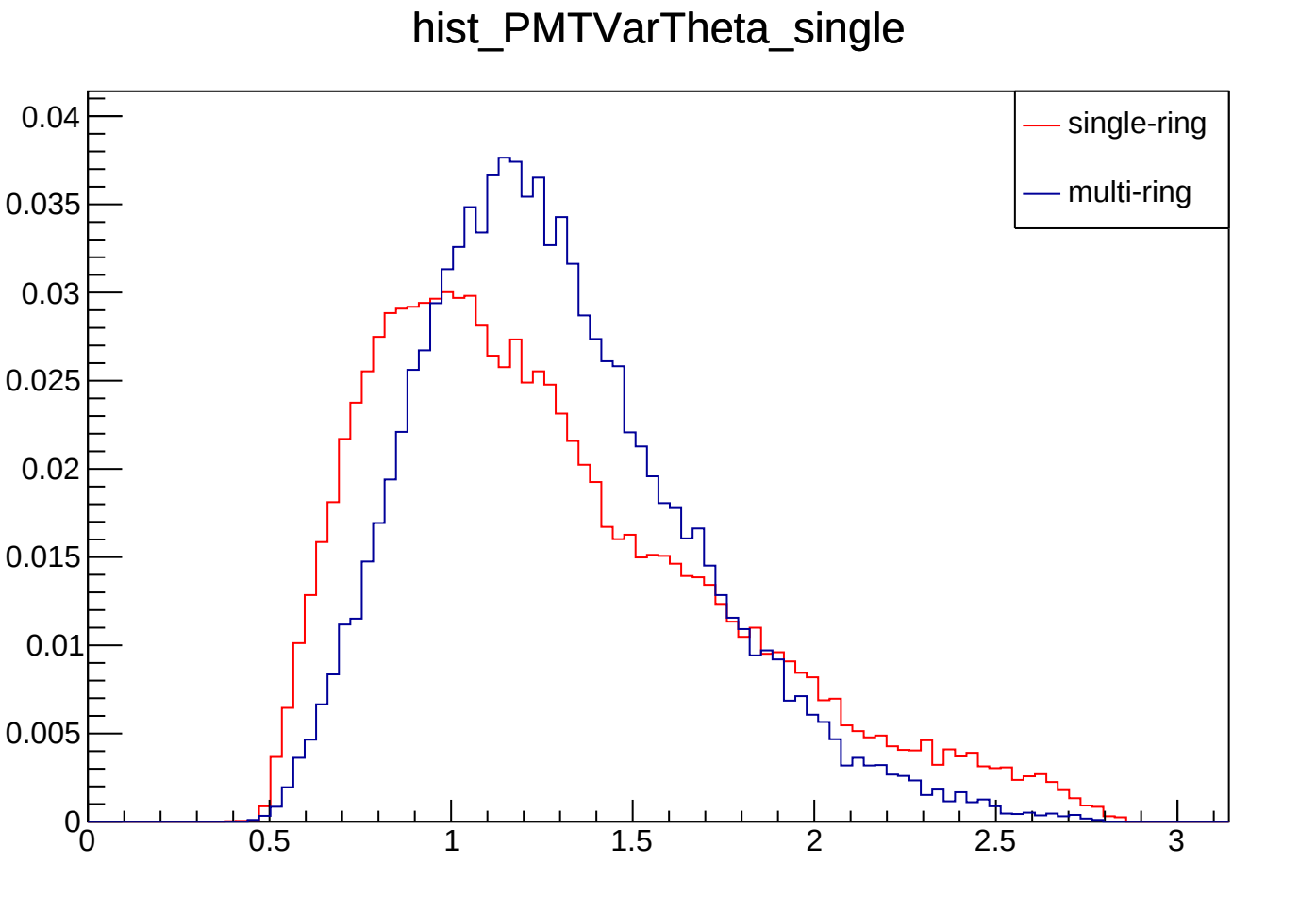

hist_PMTFracClustered_single
single-ring
multi-ring
0.25
0.2
0.15
0.1
0.05
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

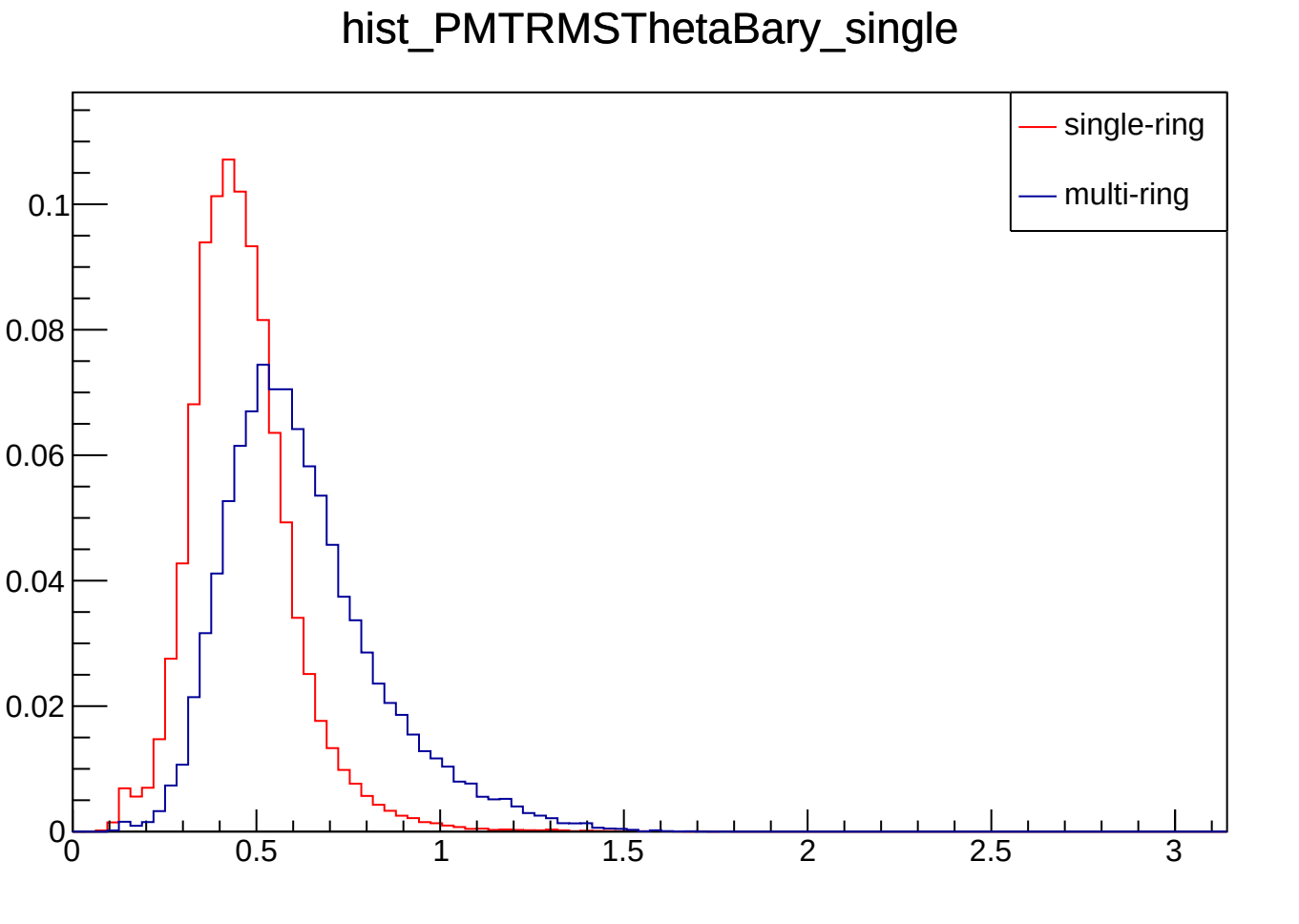

hist_PMTFracLowQ_single
single-ring
multi-ring
0.05
0.04
0.03
0.02
0.01
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

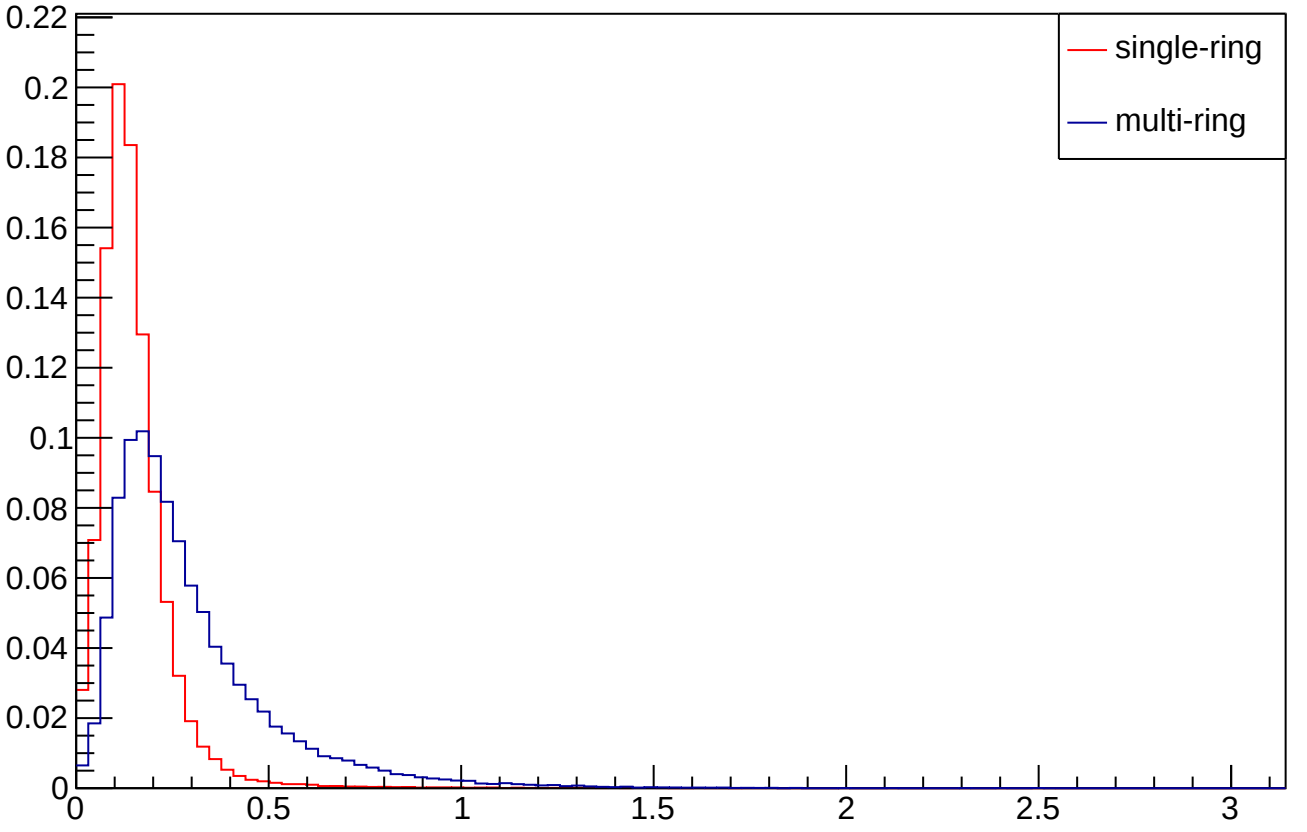

hist_PMTFracEarly_single
single-ring
multi-ring
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

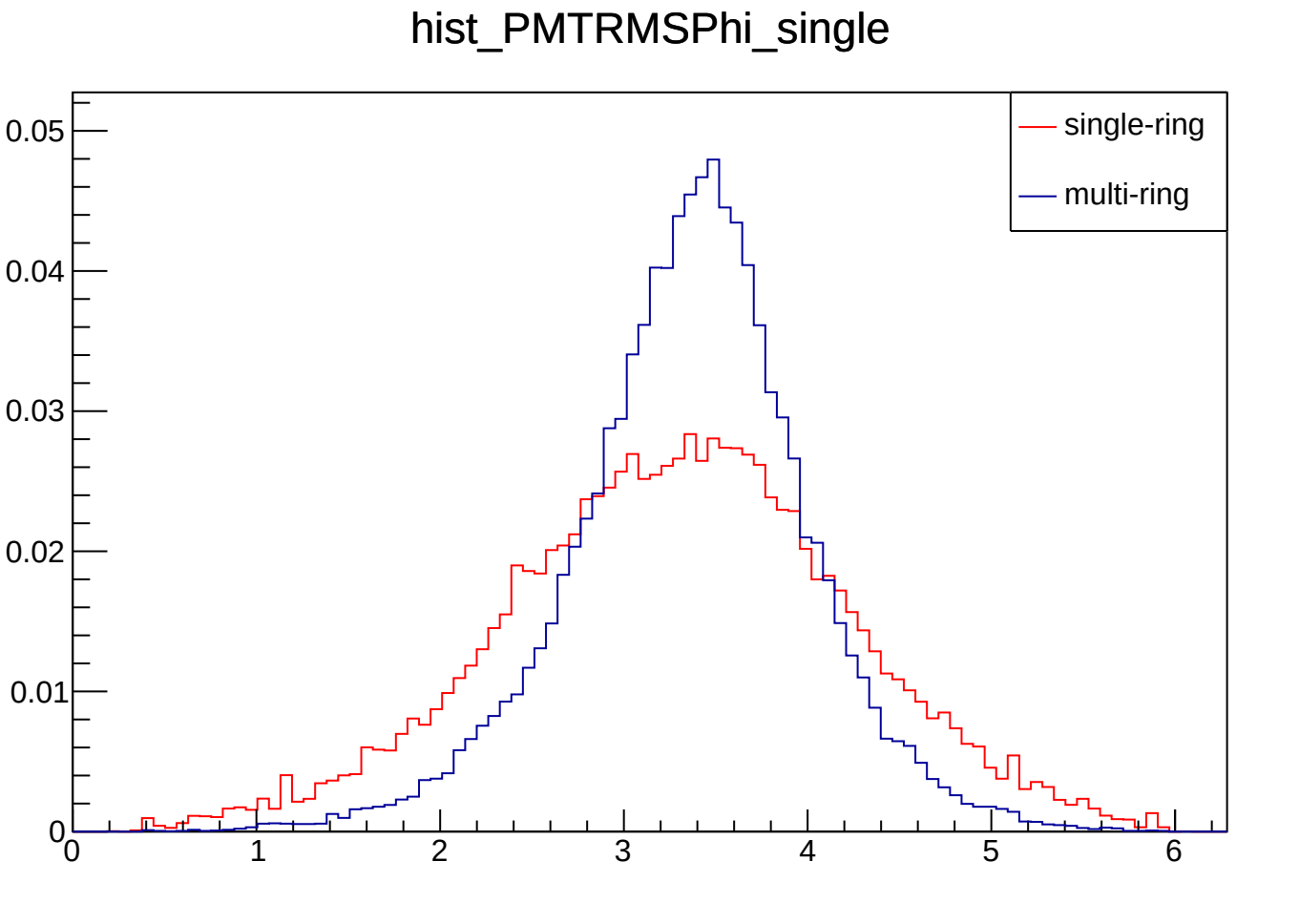

hist_PMTFracLate_single
single-ring
multi-ring
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

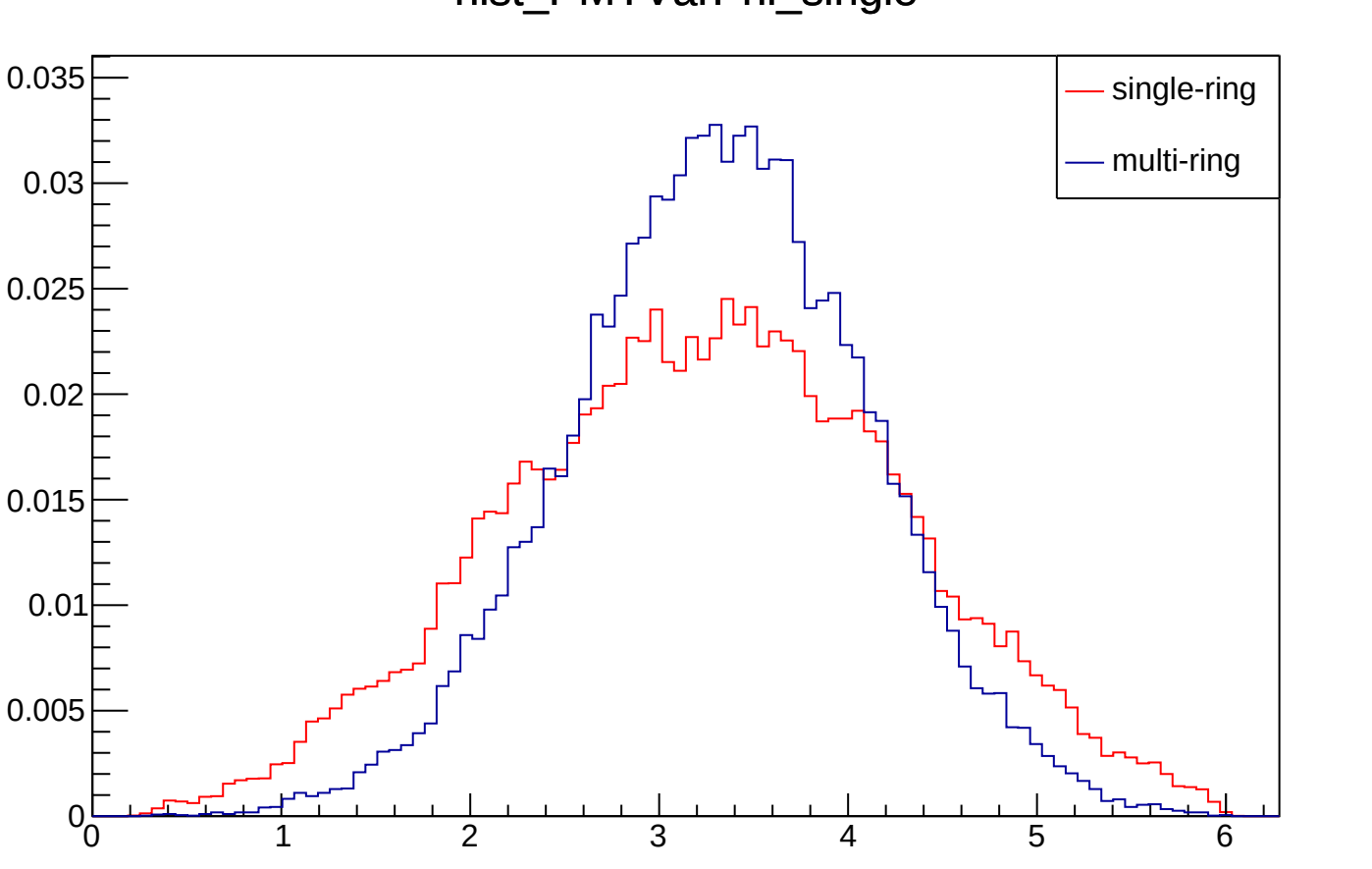

hist_PMTRMSTheta_single
single-ring
multi-ring
0.05
0.04
0.03
0.02
0.01
0
0
0.5
1
1.5
2
2.5
3


hist_PMTVarTheta_single
single-ring
multi-ring
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
0.5
1
1.5
2
2.5
3


hist_PMTRMSThetaBary_single
single-ring
multi-ring
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3


hist_PMTVarThetaBary_single
single-ring
multi-ring
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3


hist_PMTRMSPhi_single
single-ring
multi-ring
0.05
0.04
0.03
0.02
0.01
0
0
1
2
3
4
5
6


hist_PMTVarPhi_single
single-ring
multi-ring
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
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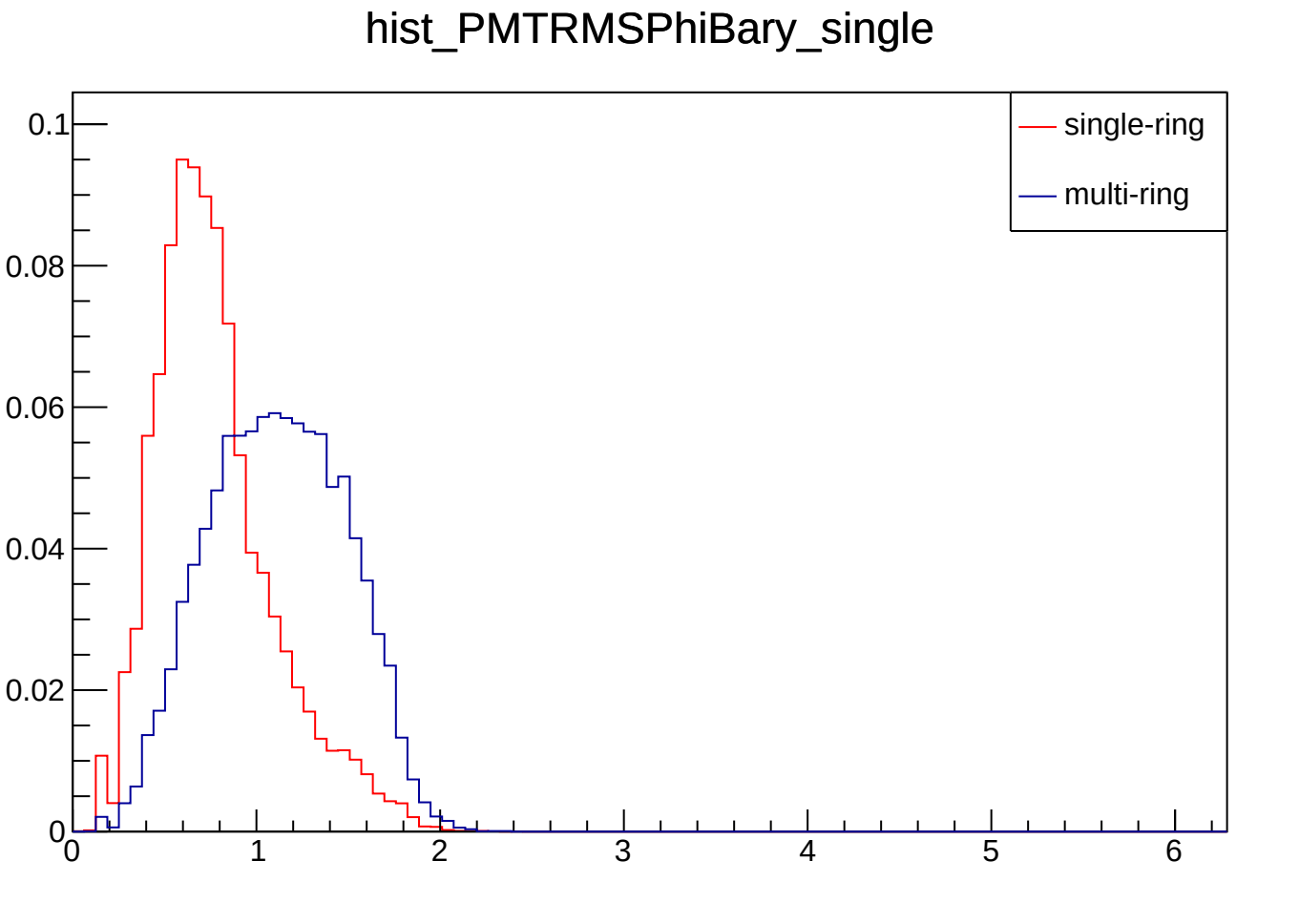
3
4
5
6


hist_PMTRMSPhiBary_single
single-ring
multi-ring
0.1
0.08
0.06
0.04
0.02
0
0
1
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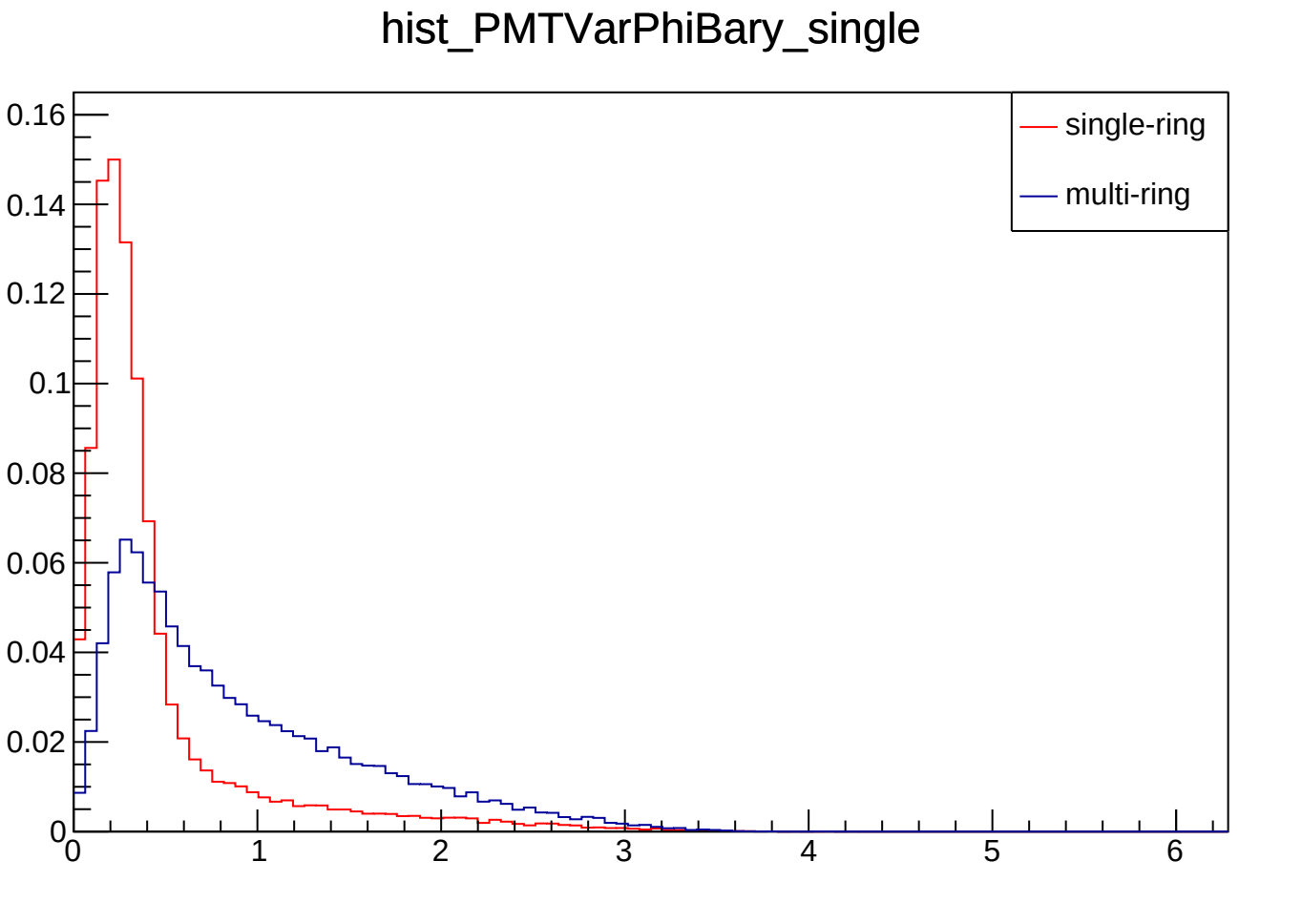
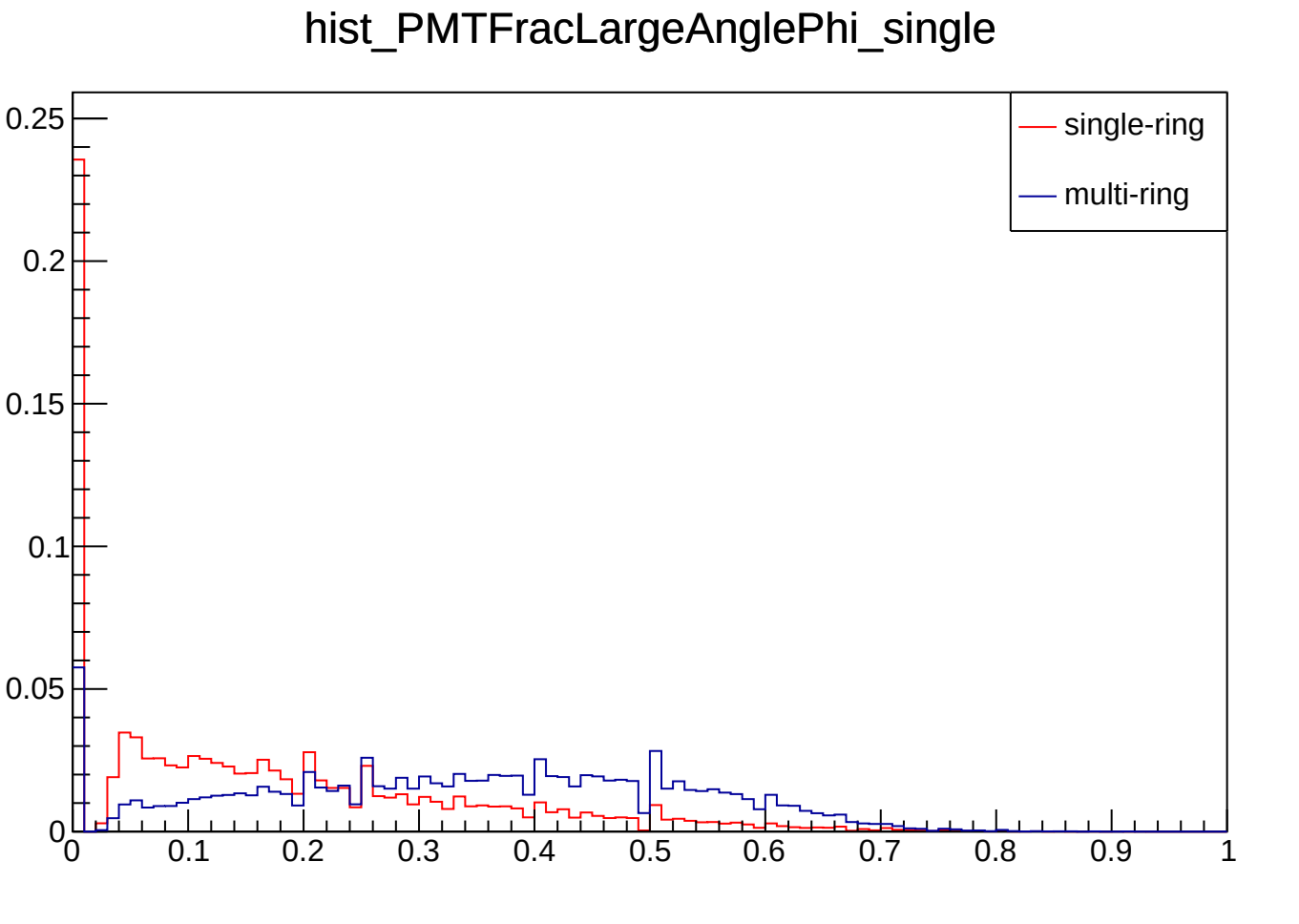
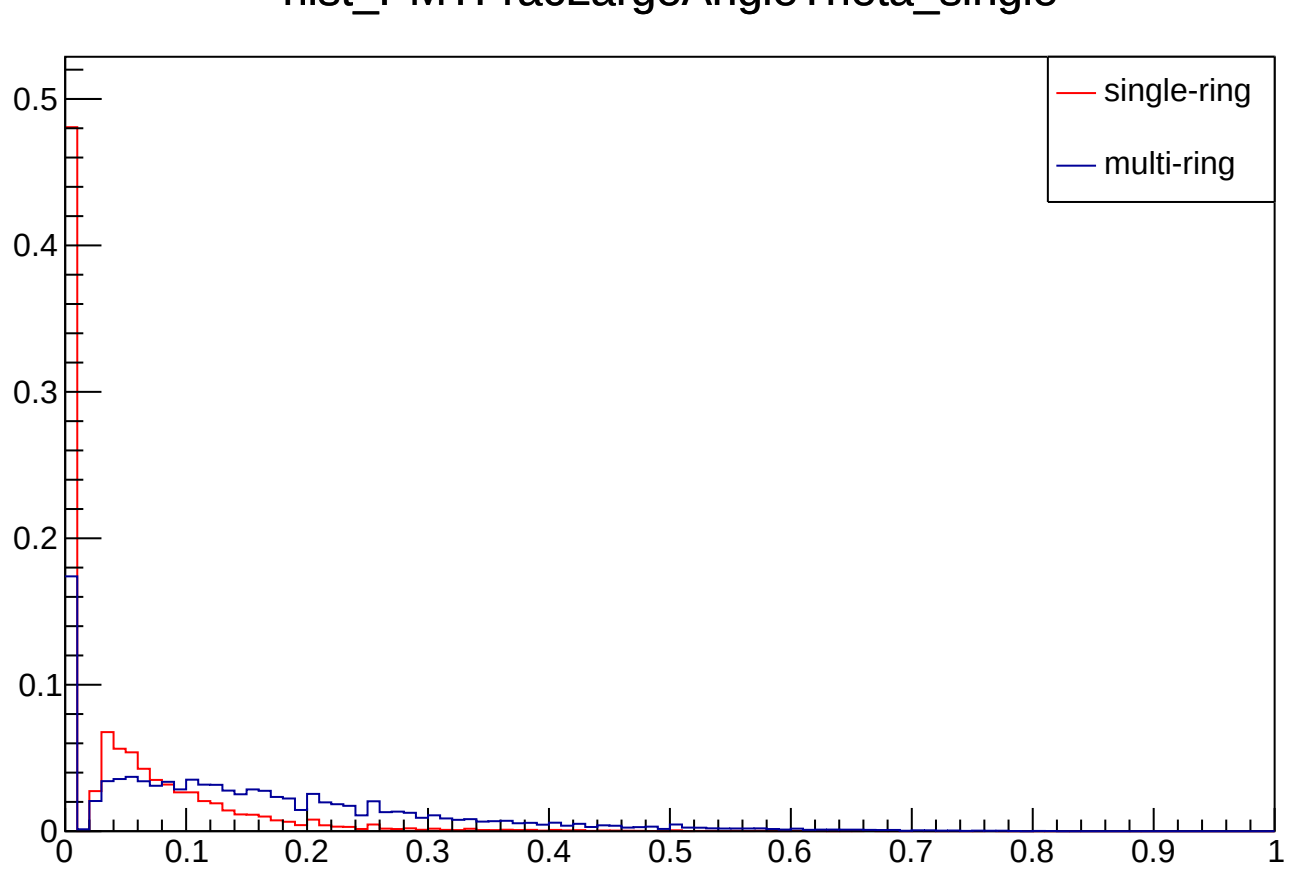
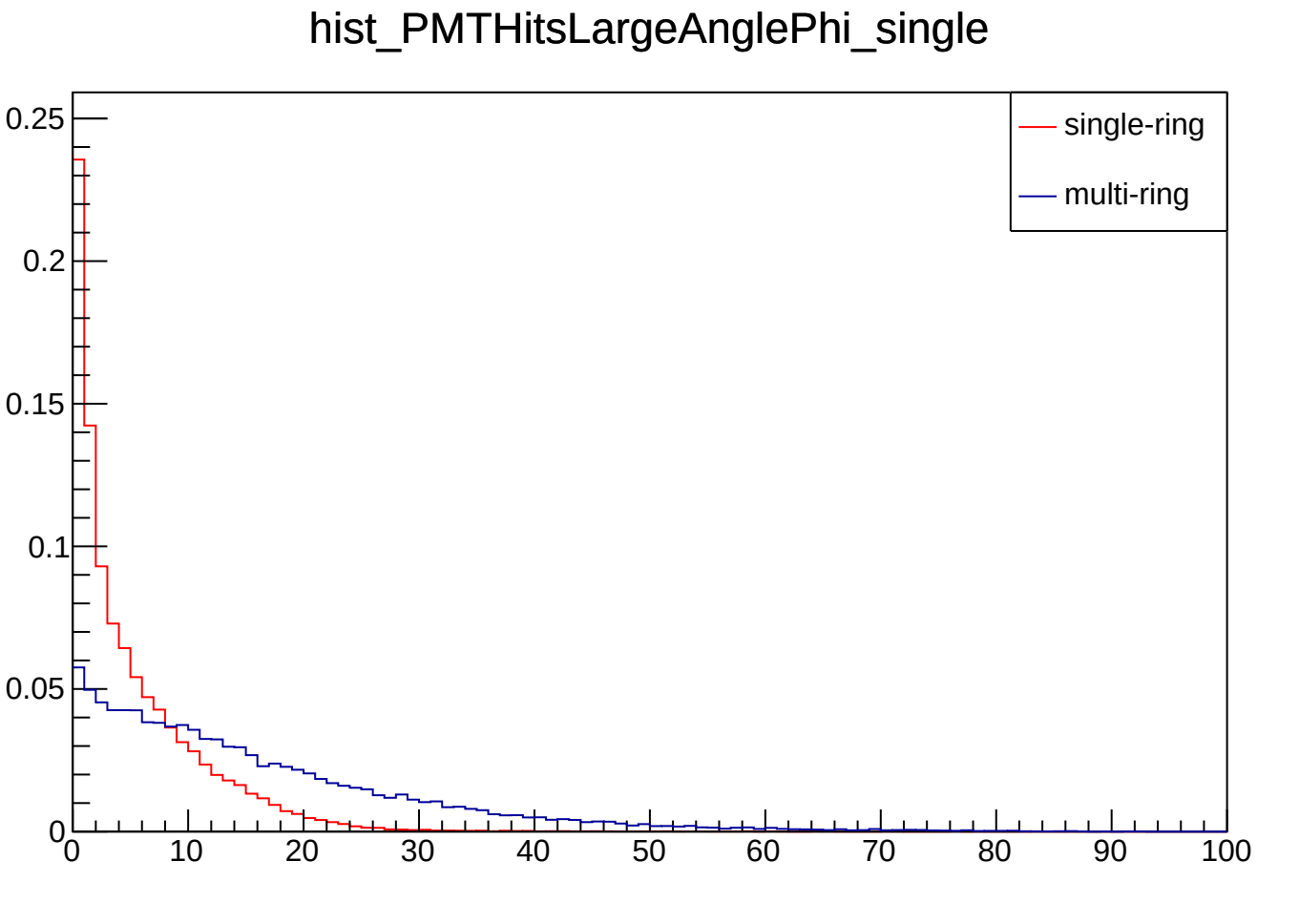
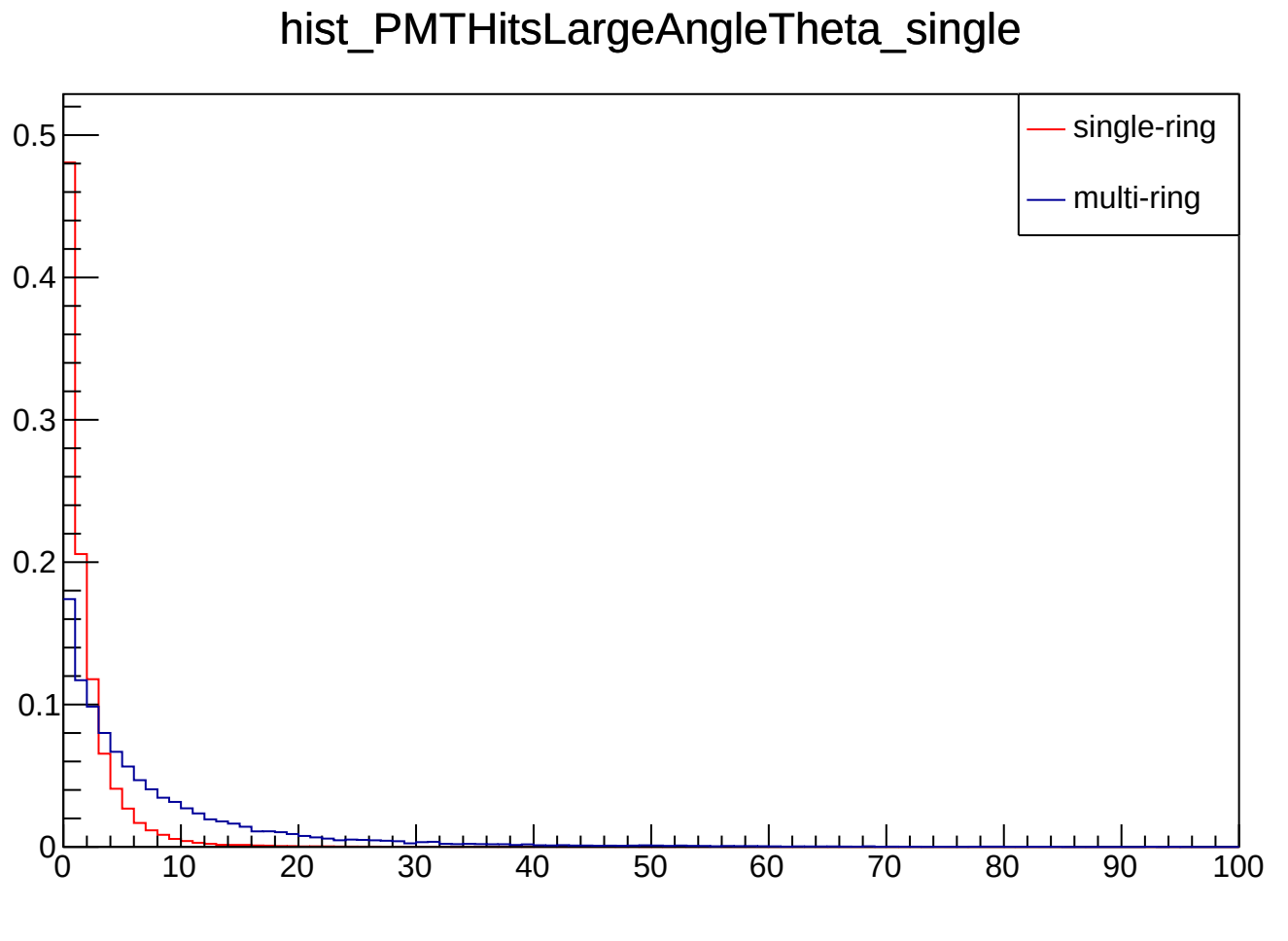
3
4
5
6


hist_PMTVarPhiBary_single
single-ring
multi-ring
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
1
2
3
4
5
6


hist_PMTFracLargeAnglePhi_single
single-ring
multi-ring
0.25
0.2
0.15
0.1
0.05
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


hist_PMTFracLargeAngleTheta_single
single-ring
multi-ring
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


hist_PMTHitsLargeAnglePhi_single
single-ring
multi-ring
0.25
0.2
0.15
0.1
0.05
0
0
10
20
30
40
50
60
70
80
90
100


hist_PMTHitsLargeAngleTheta_single
single-ring
multi-ring
0.5
0.4
0.3
0.2
0.1
0
0
10
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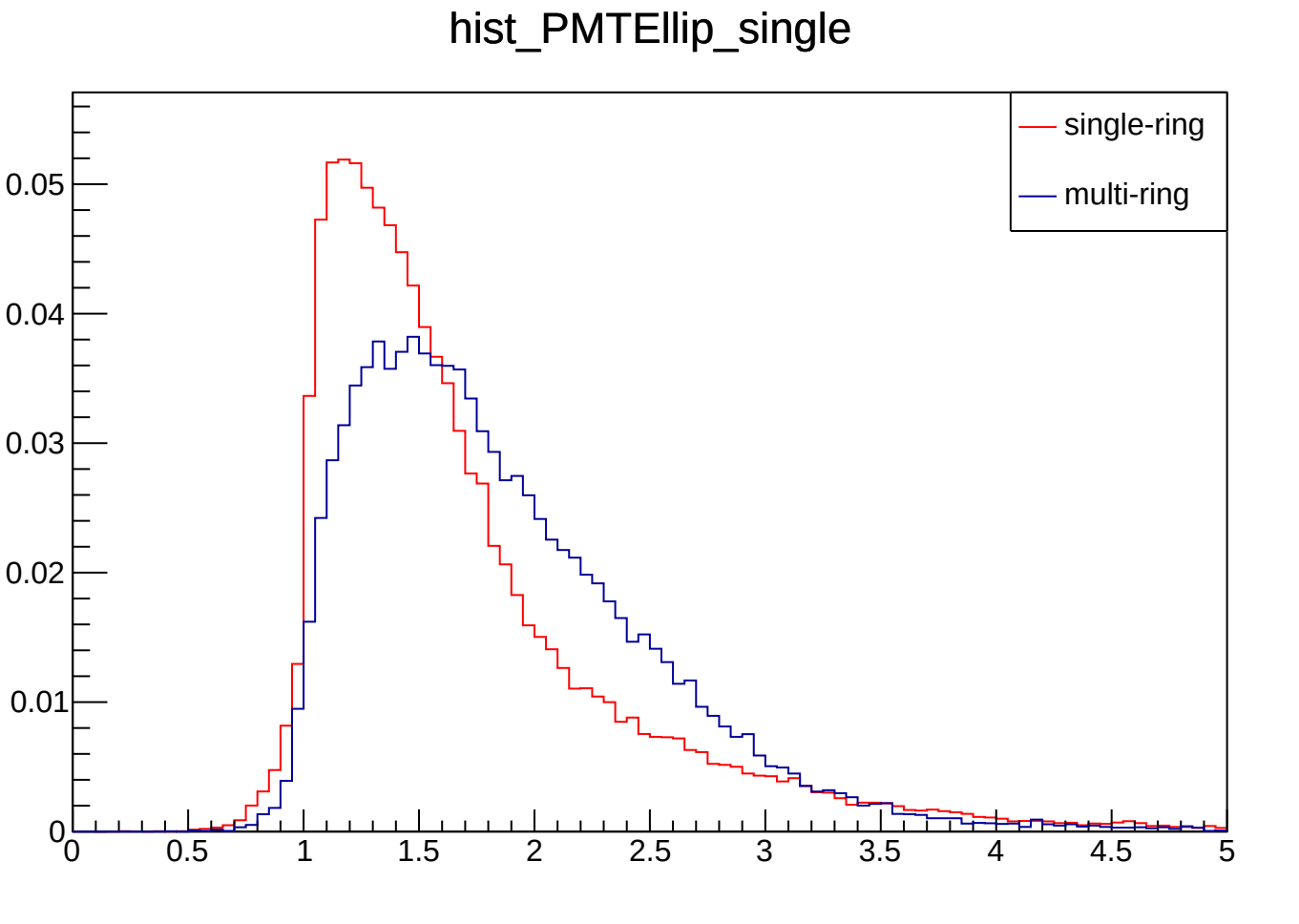
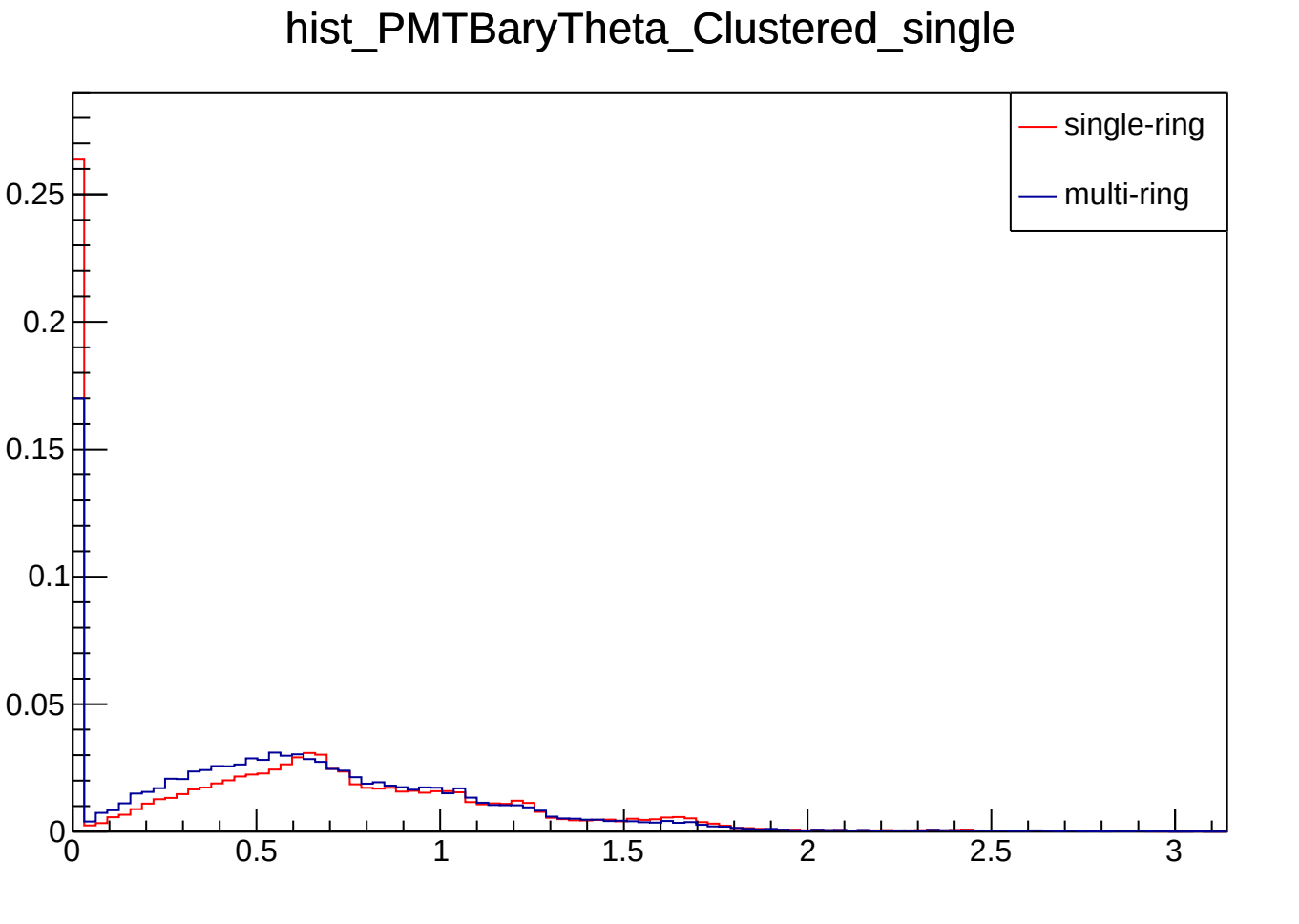
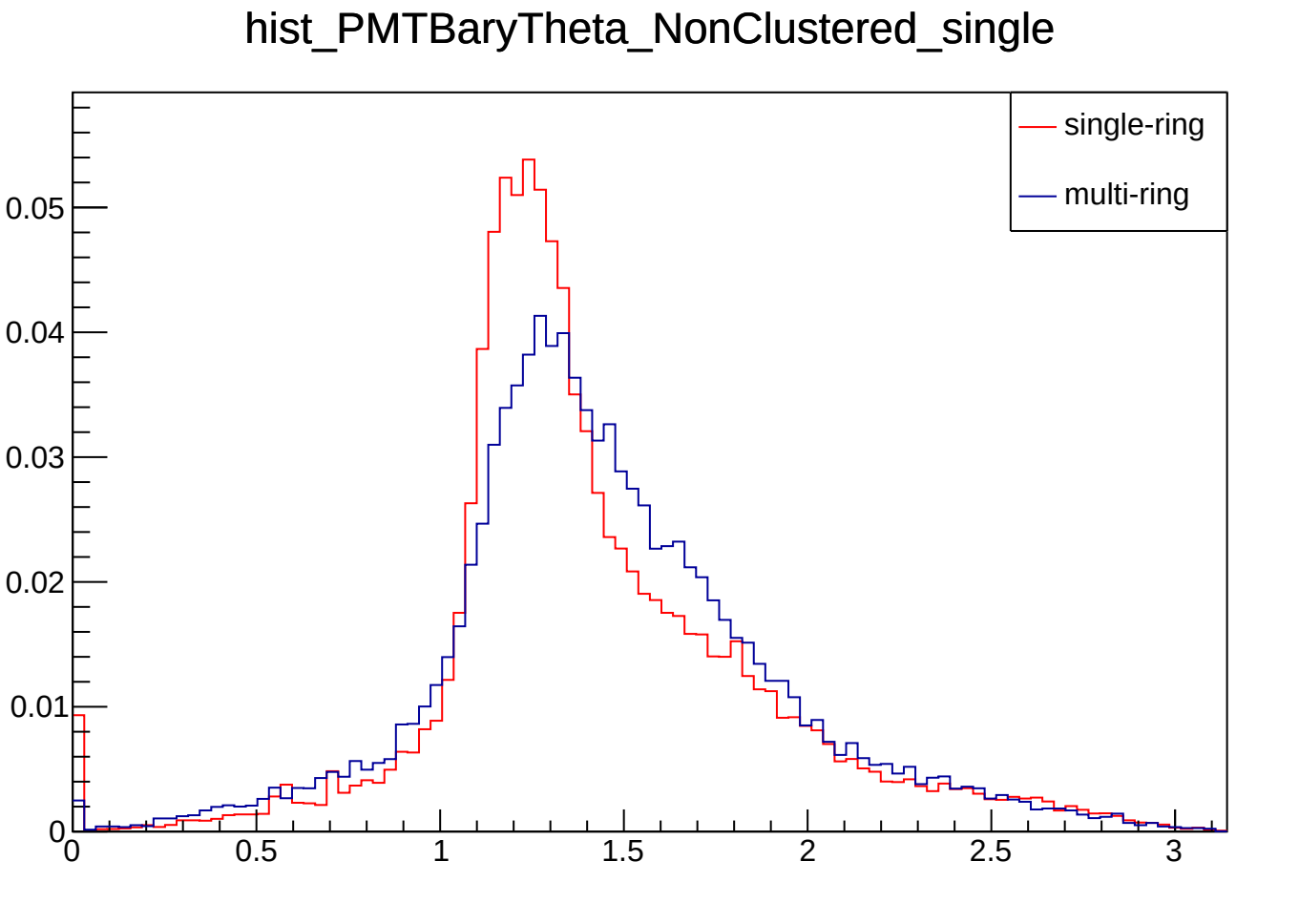
70
80
90
100


hist_PMTEllip_single
single-ring
multi-ring
0.05
0.04
0.03
0.02
0.01
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5


hist_PMTBaryTheta_Clustered_single
single-ring
multi-ring
0.25
0.2
0.15
0.1
0.05
0
0
0.5
1
1.5
2
2.5
3


hist_PMTBaryTheta_NonClustered_single
single-ring
multi-ring
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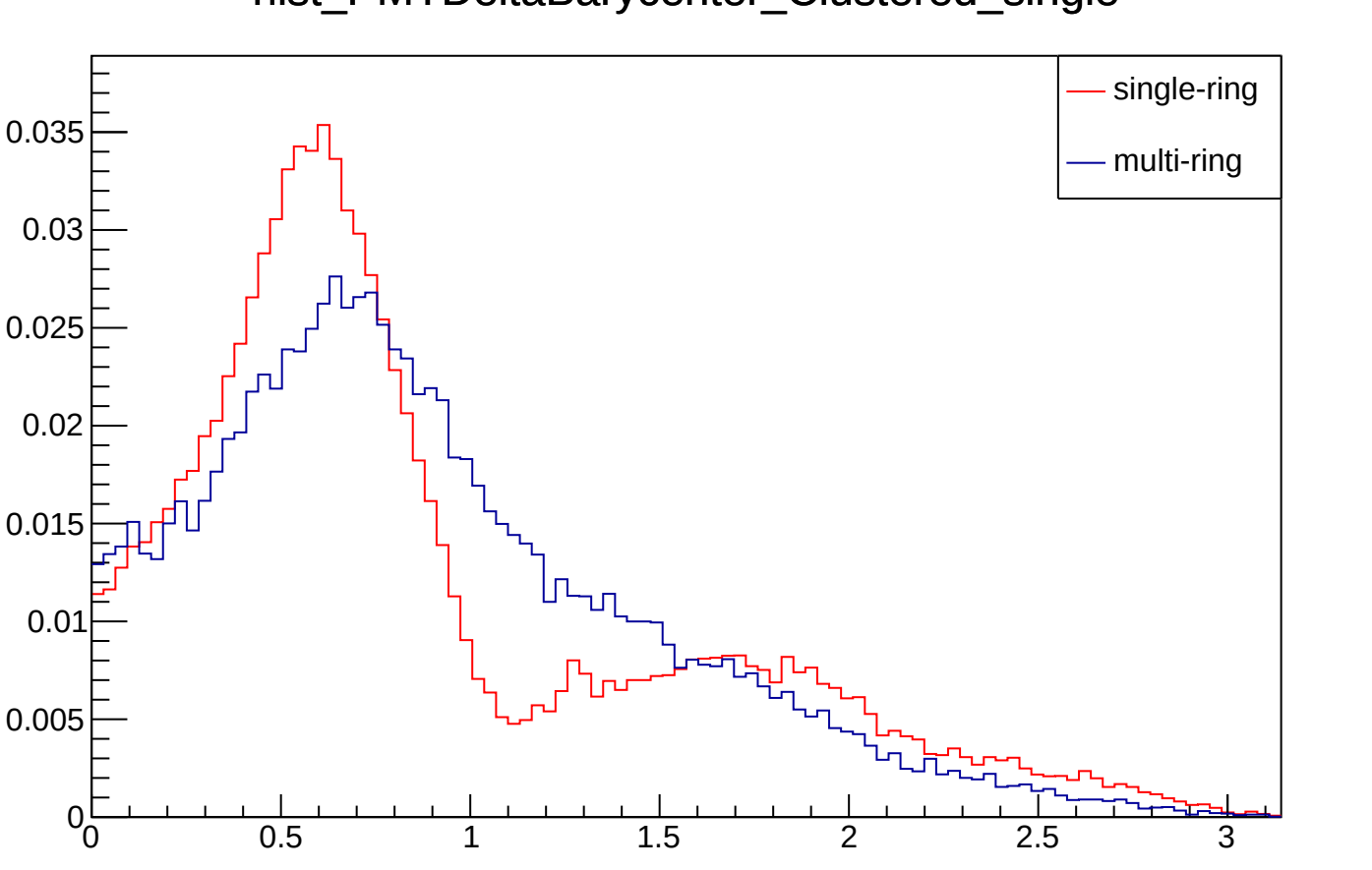
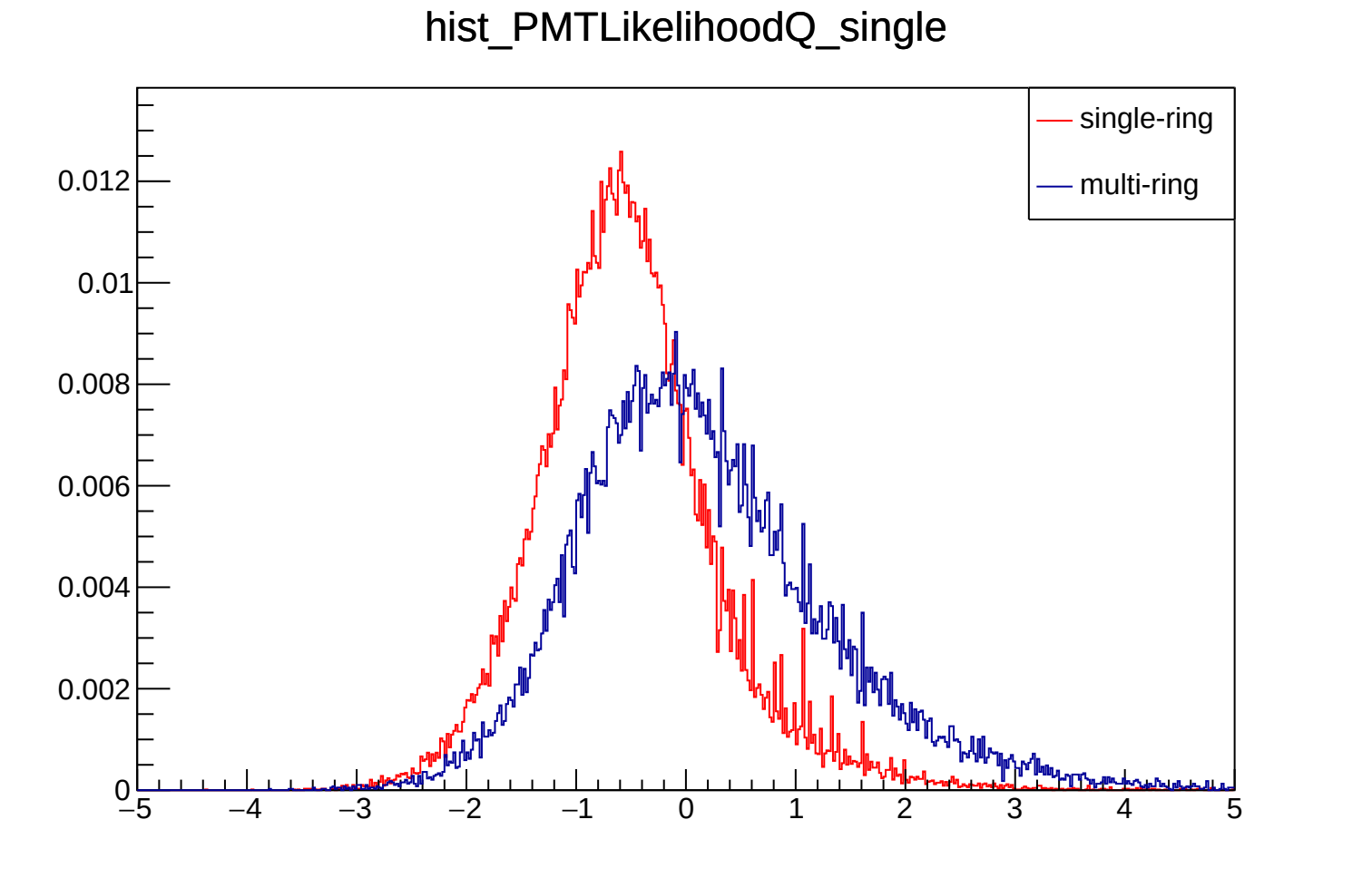
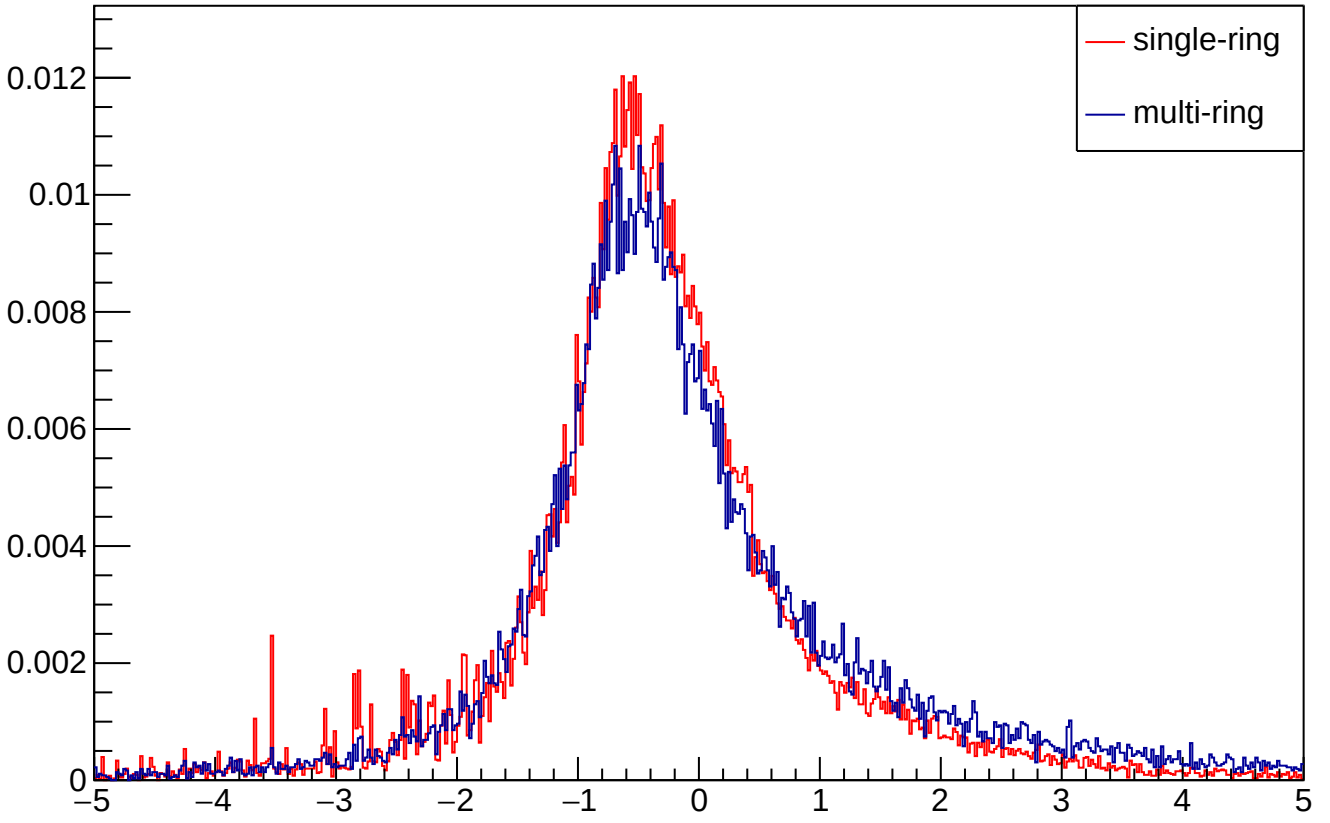
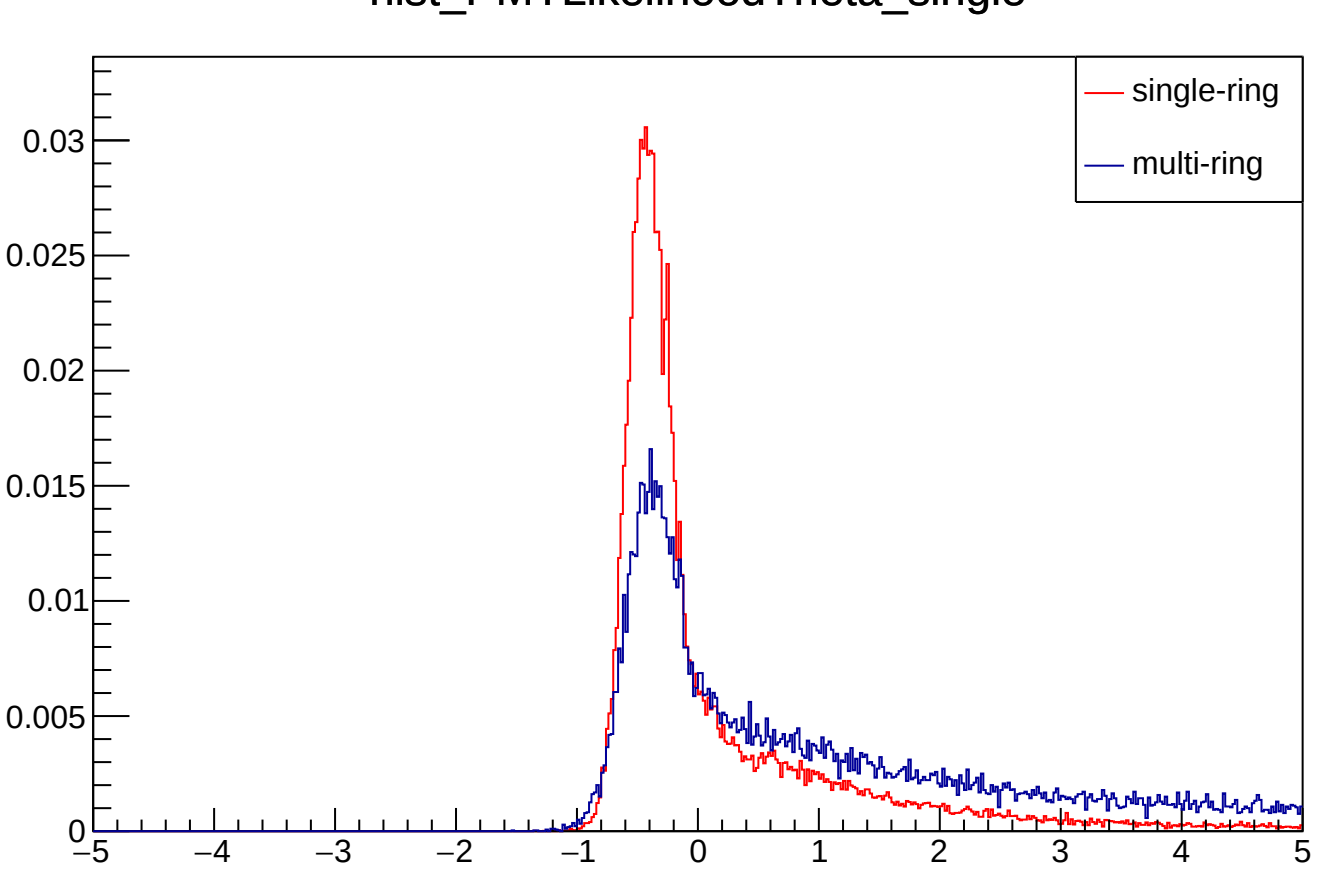
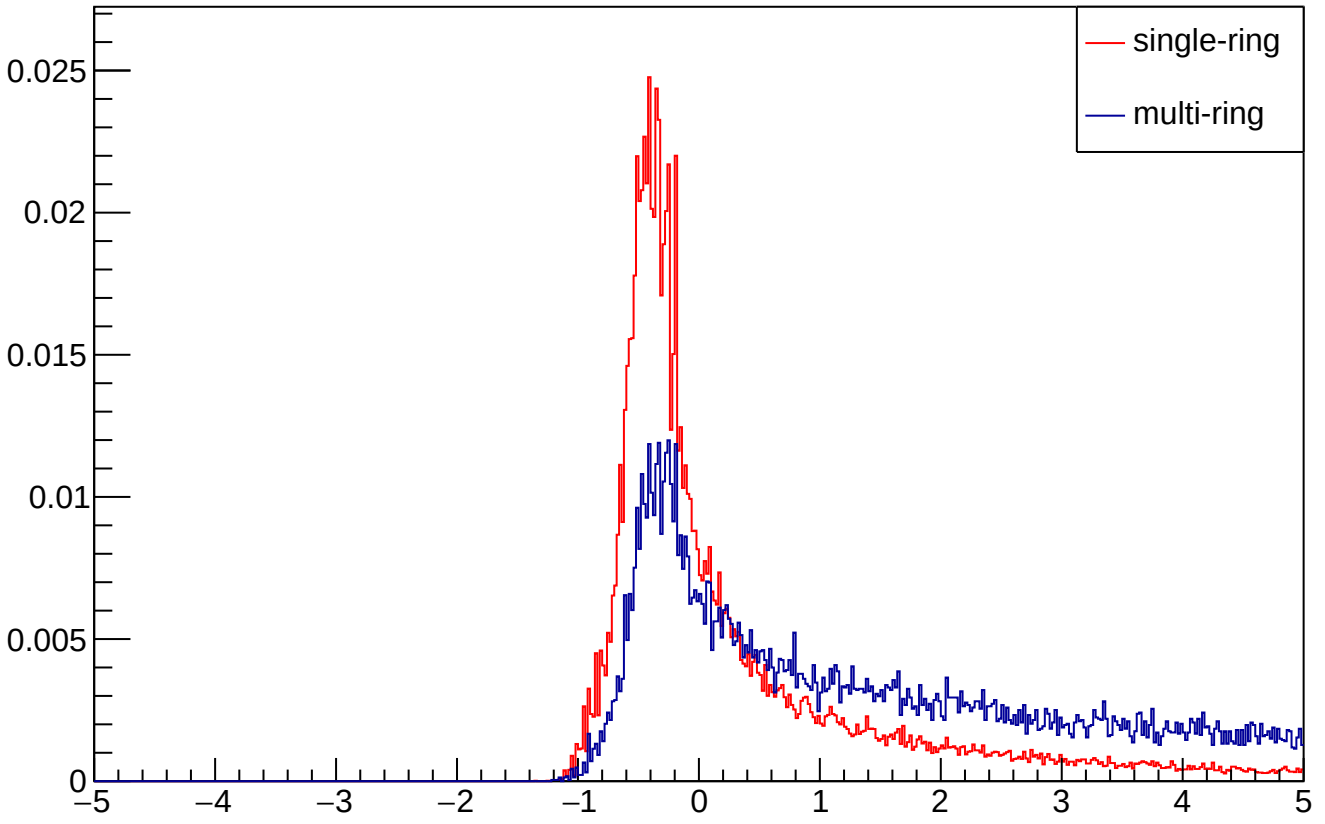
0.04
0.03
0.02
0.01
0
0
0.5
1
1.5
2
2.5
3

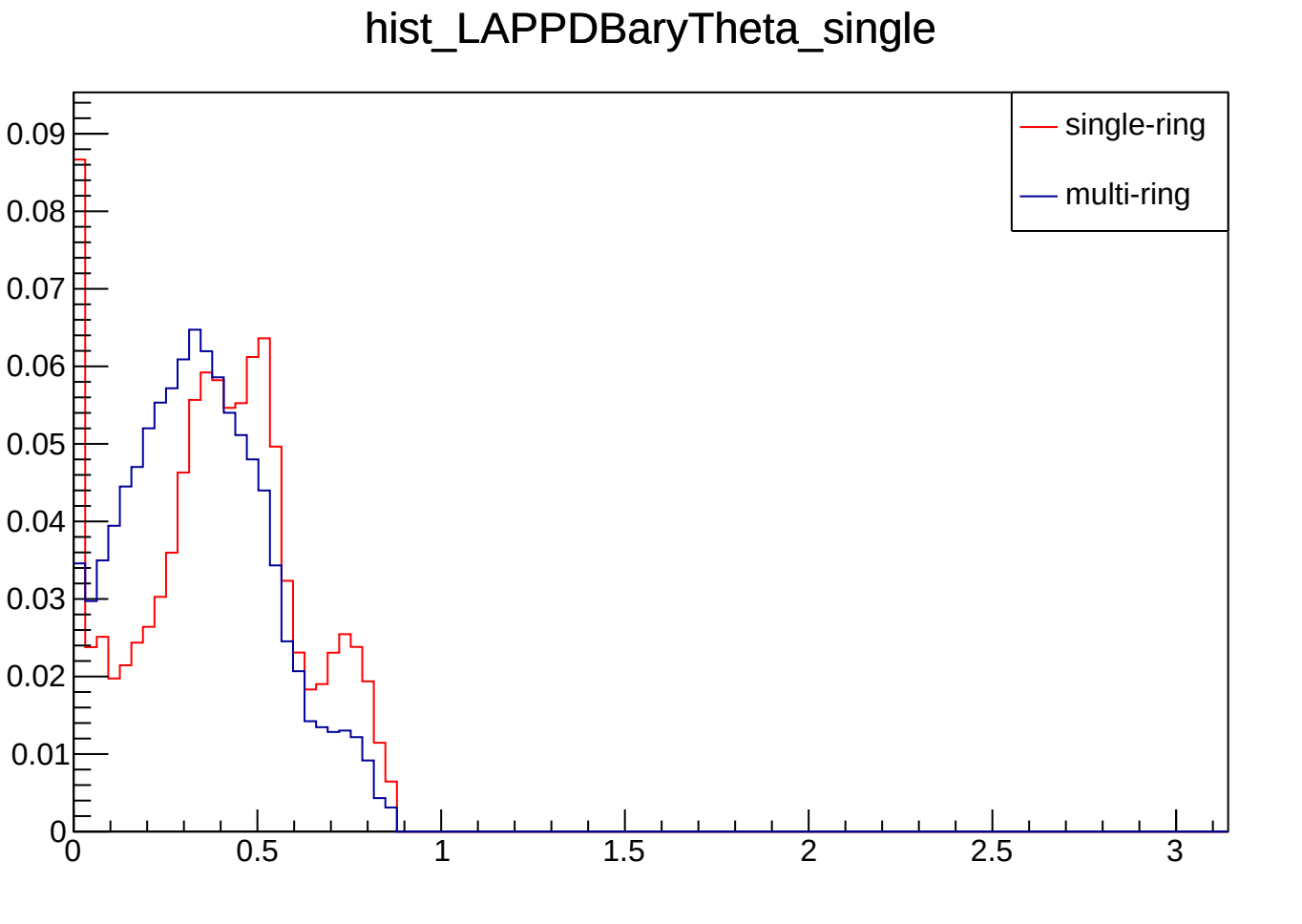

hist_PMTDeltaBarycenter_Clustered_single
single-ring
multi-ring
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
0.5
1
1.5
2
2.5
3

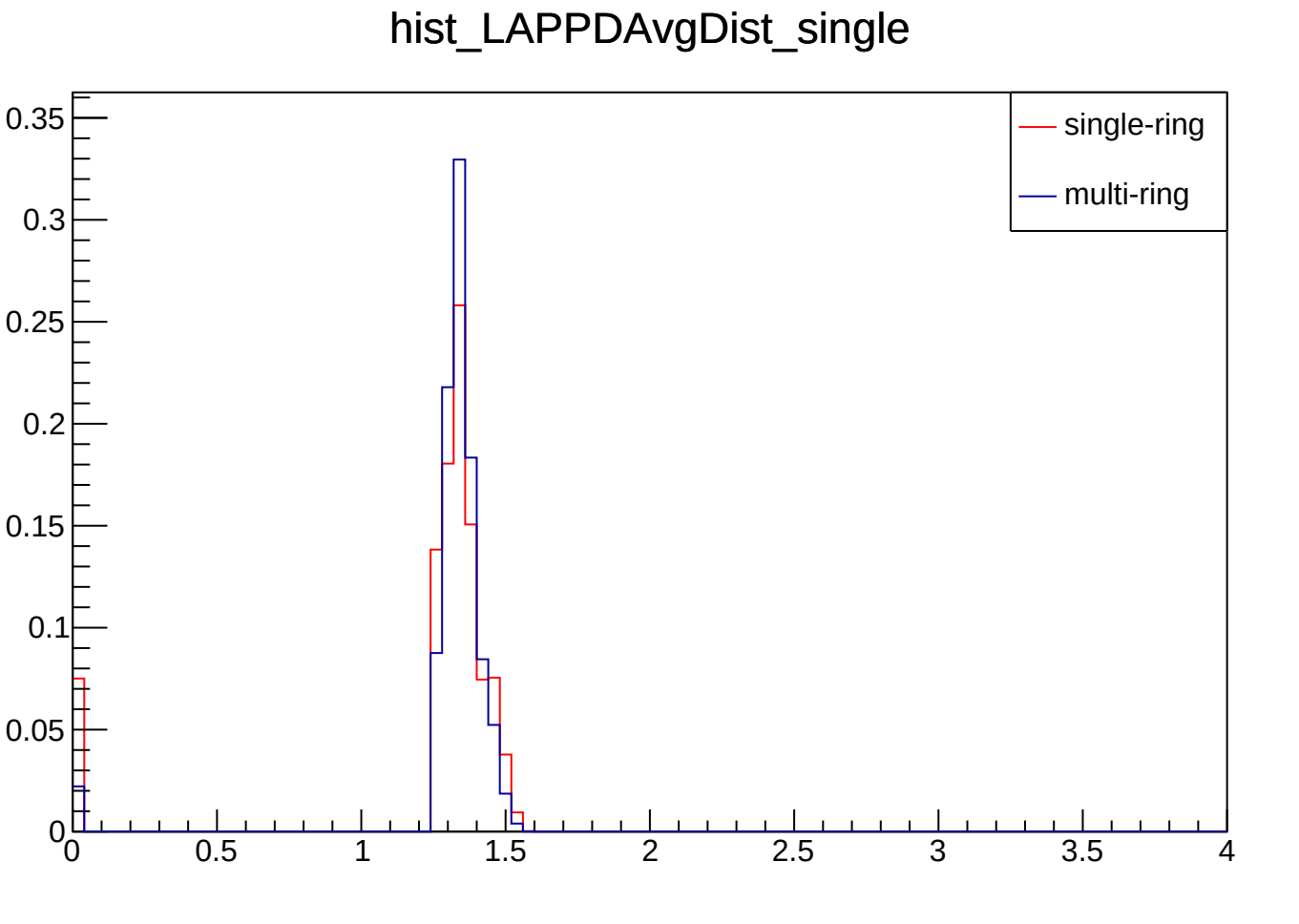

hist_PMTLikelihoodQ_single
single-ring
multi-ring
0.012
0.01
0.008
0.006
0.004
0.002
0
−5
−4
−3
−2
−1
0
1
2
3
4
5

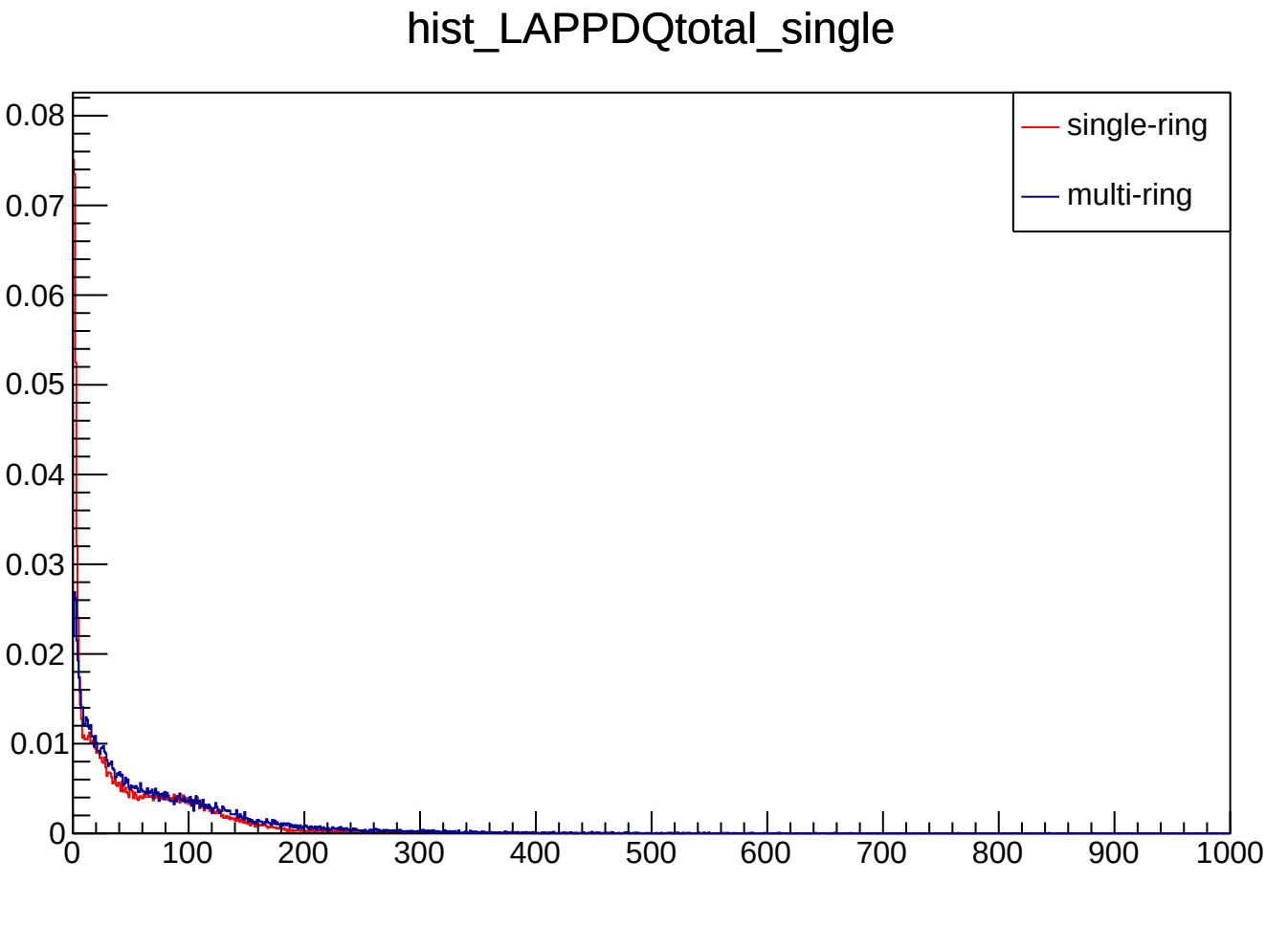

hist_PMTLikelihoodT_single
single-ring
multi-ring
0.012
0.01
0.008
0.006
0.004
0.002
0
−5
−4
−3
−2
−1
0
1
2
3
4
5

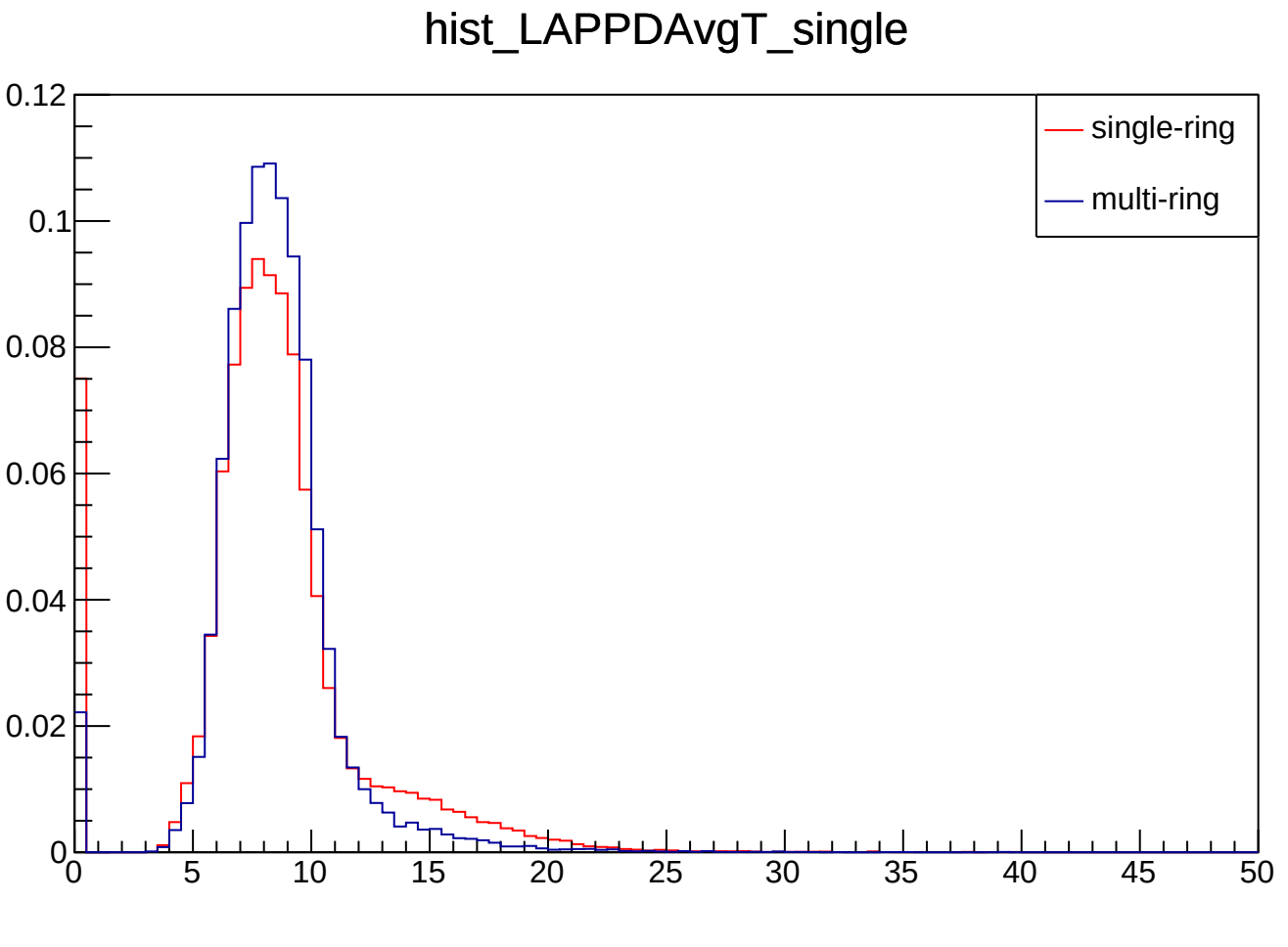

hist_PMTLikelihoodTheta_single
single-ring
multi-ring
0.03
0.025
0.02
0.015
0.01
0.005
0
−5
−4
−3
−2
−1
0
1
2
3
4
5

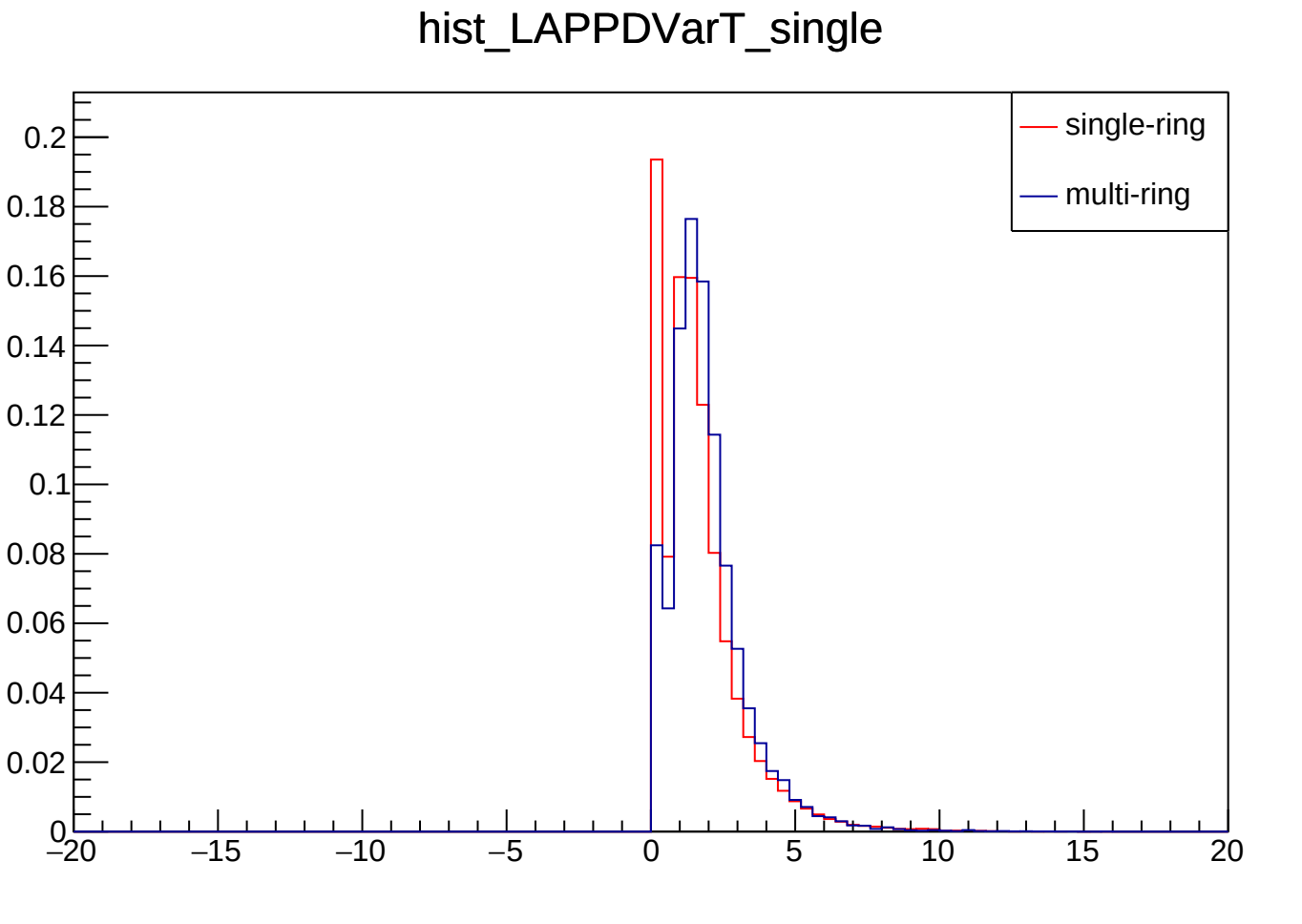

hist_PMTLikelihoodPhi_single
single-ring
multi-ring
0.025
0.02
0.015
0.01
0.005
0
−5
−4
−3
−2
−1
0
1
2
3
4
5

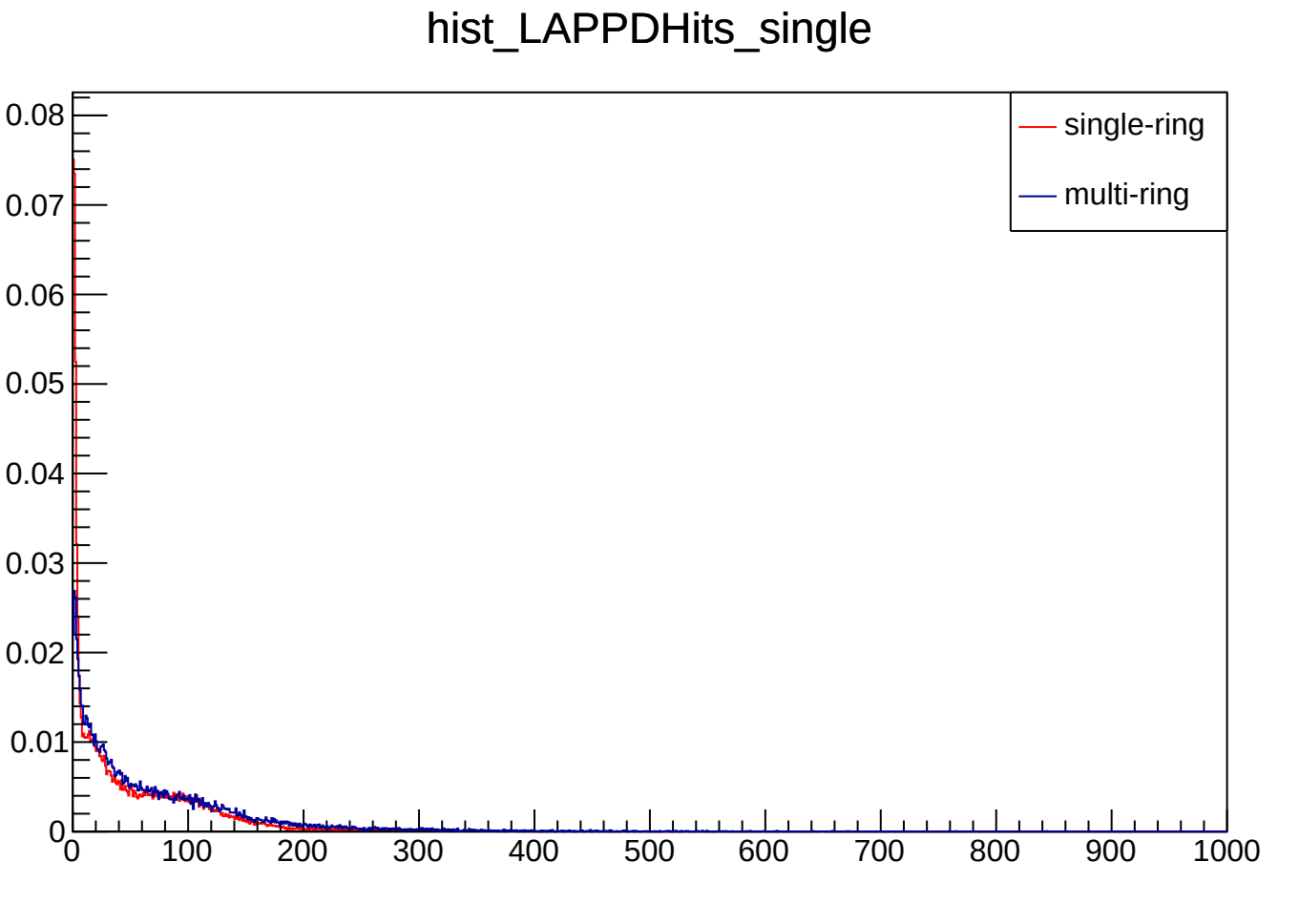

hist_LAPPDBaryTheta_single
single-ring
multi-ring
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
0.5
1
1.5
2
2.5
3


hist_LAPPDAvgDist_single
single-ring
multi-ring
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.5
1
1.5
2
2.5
3
3.5
4


hist_LAPPDQtotal_single
single-ring
multi-ring
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
100
200
300
400
500
600
700
800
900
1000


hist_LAPPDAvgT_single
single-ring
multi-ring
0.12
0.1
0.08
0.06
0.04
0.02
0
0
5
10
15
20
25
30
35
40
45
50


hist_LAPPDVarT_single
single-ring
multi-ring
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
−20
−15
−10
−5
0
5
10
15
20


hist_LAPPDHits_single
single-ring
multi-ring
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
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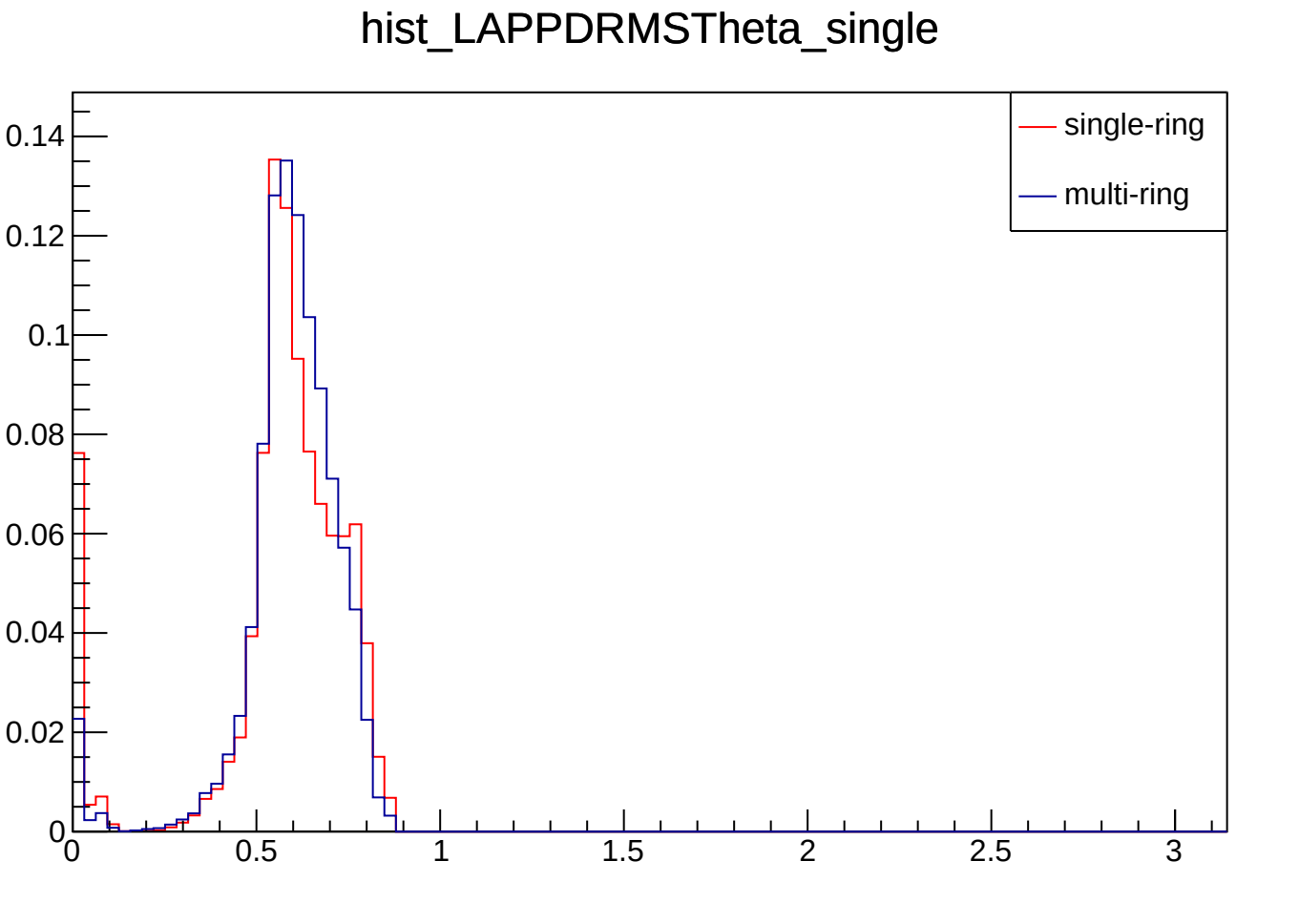
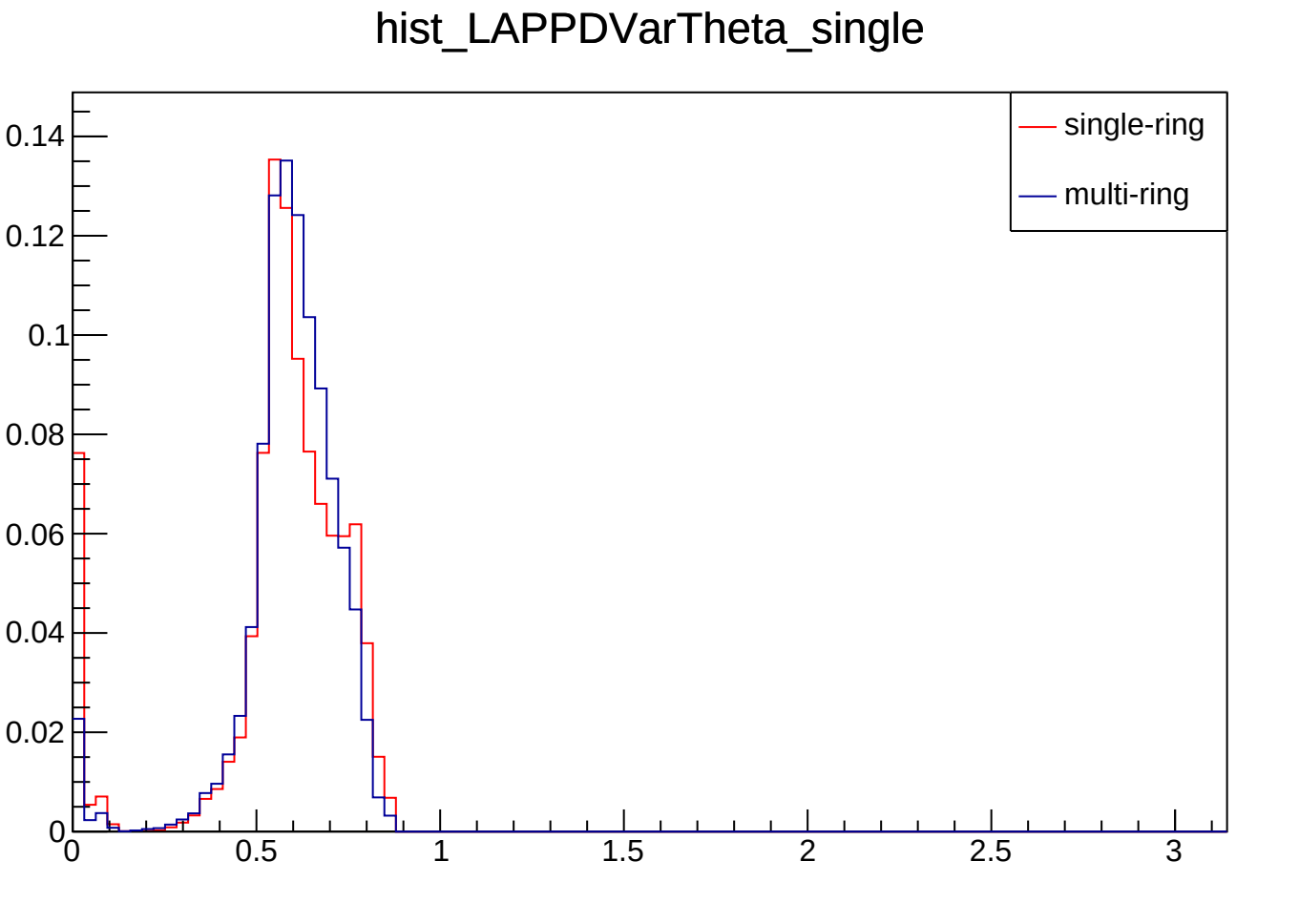
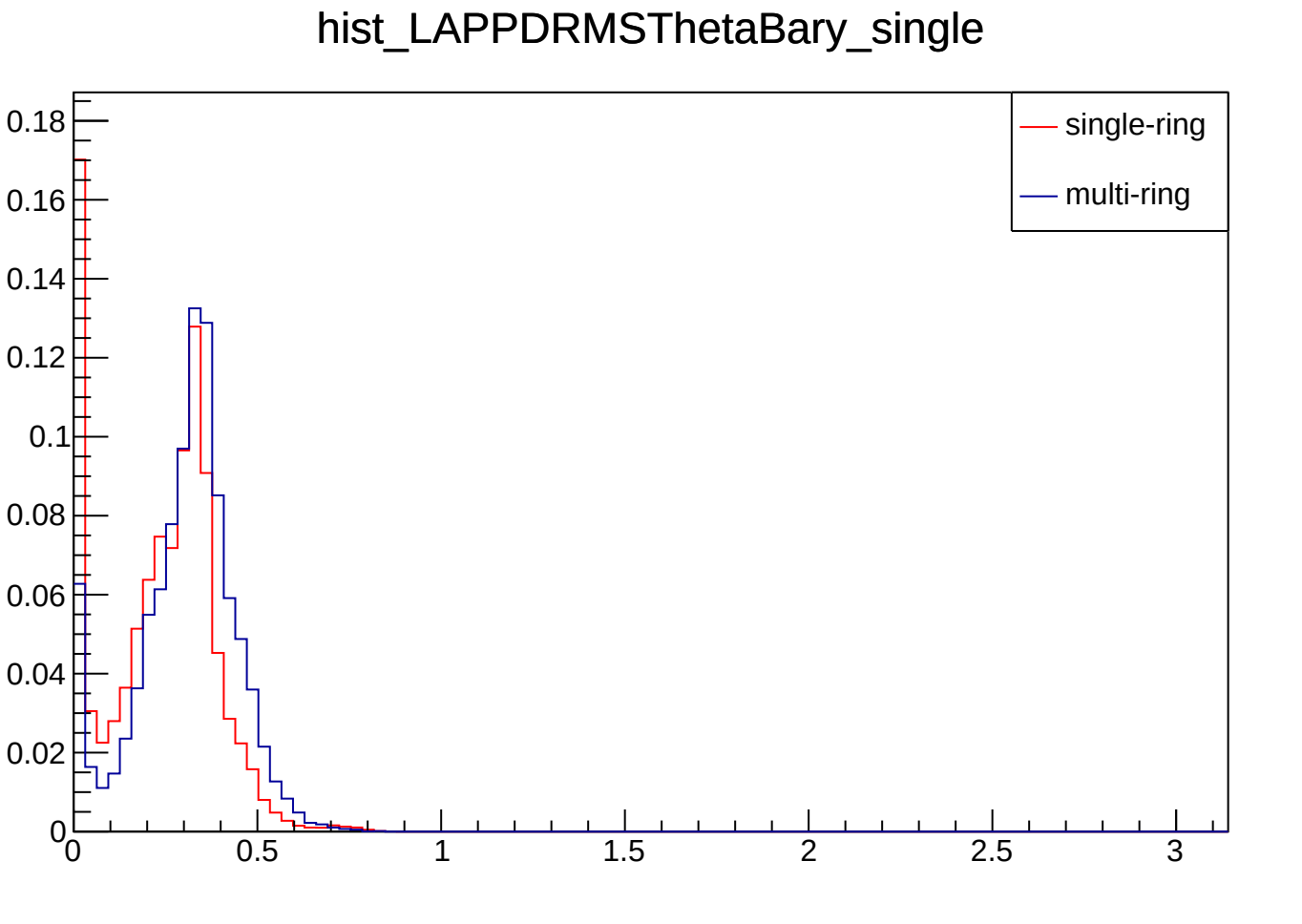
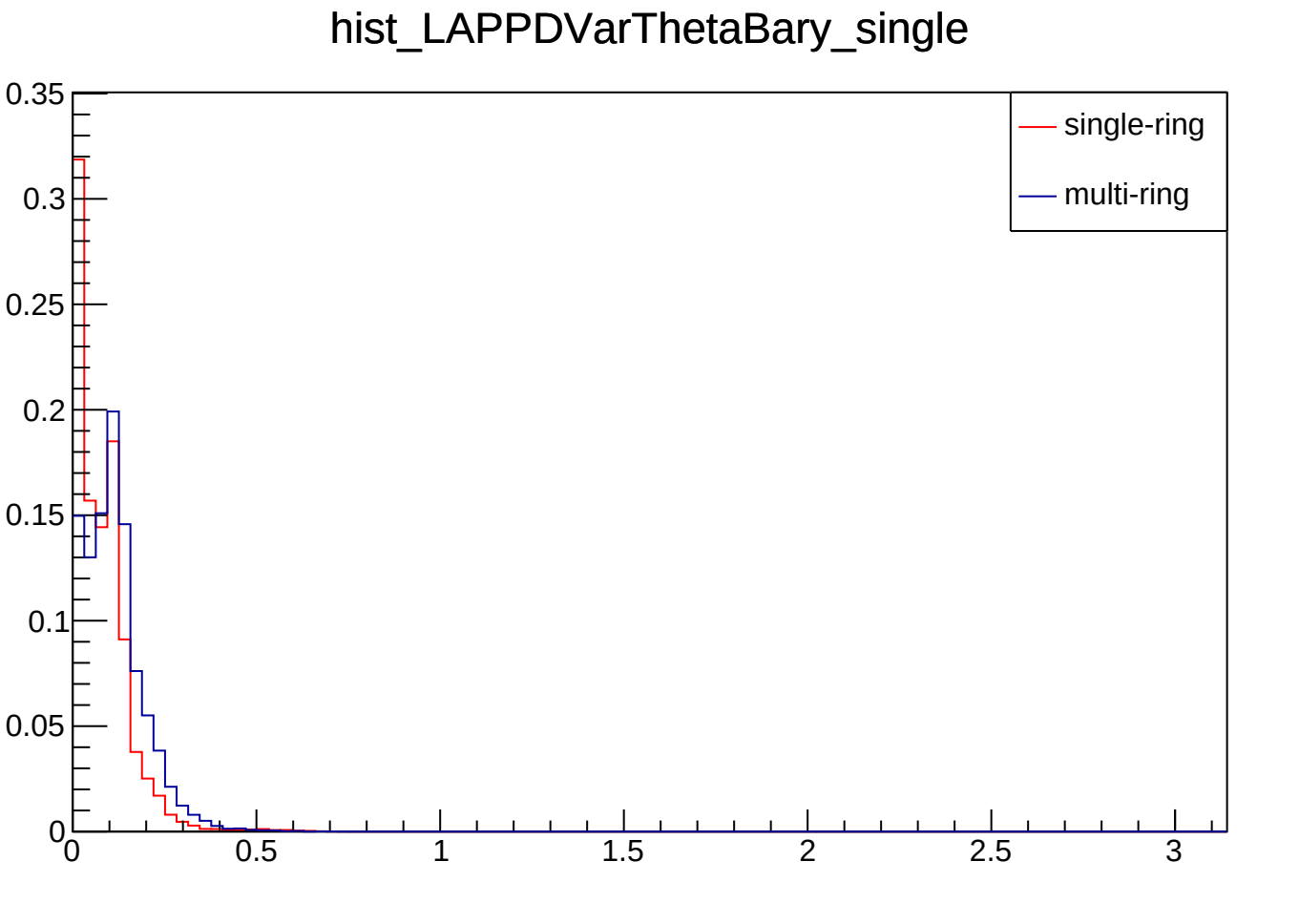
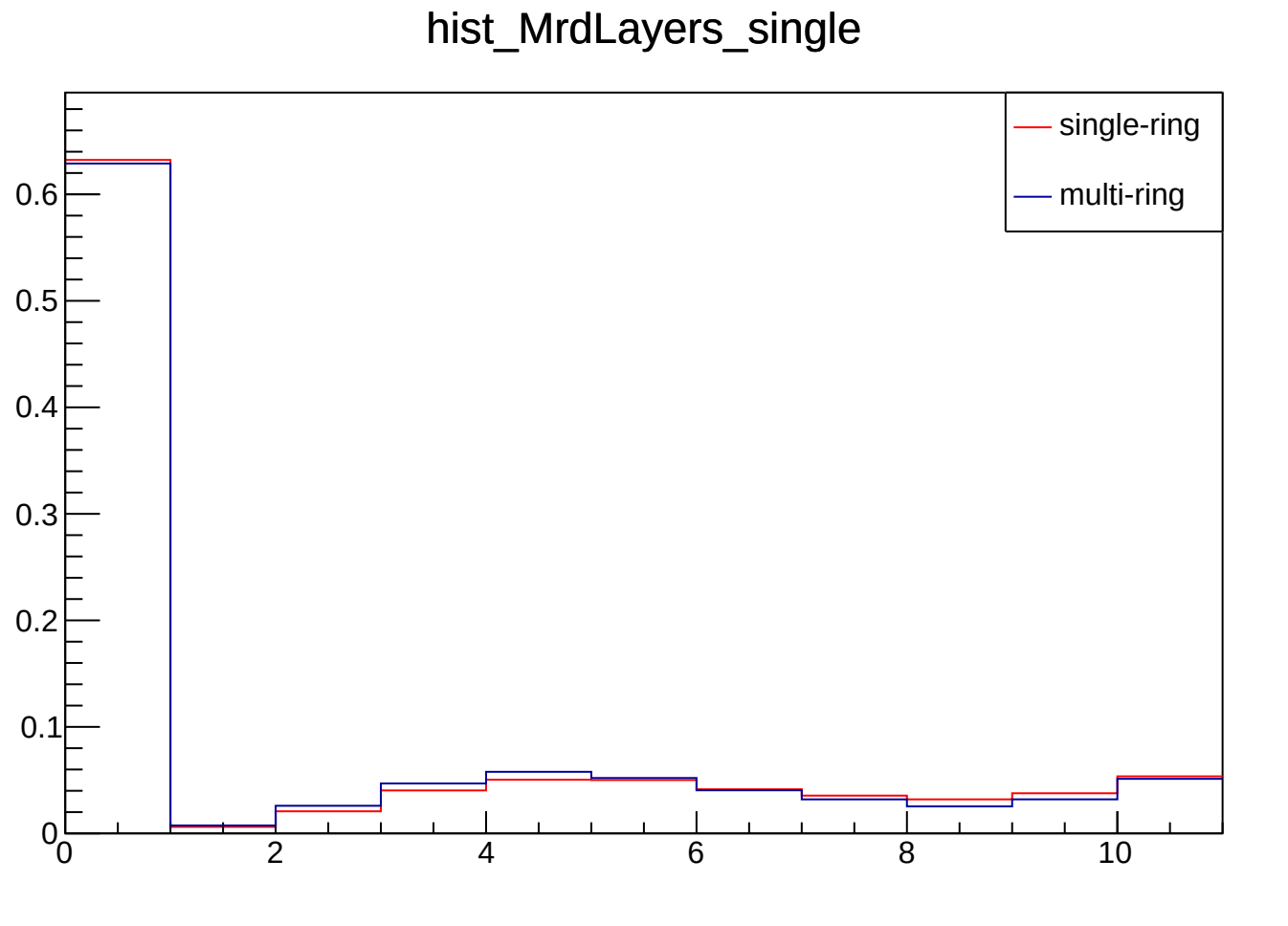
700
800
900
1000

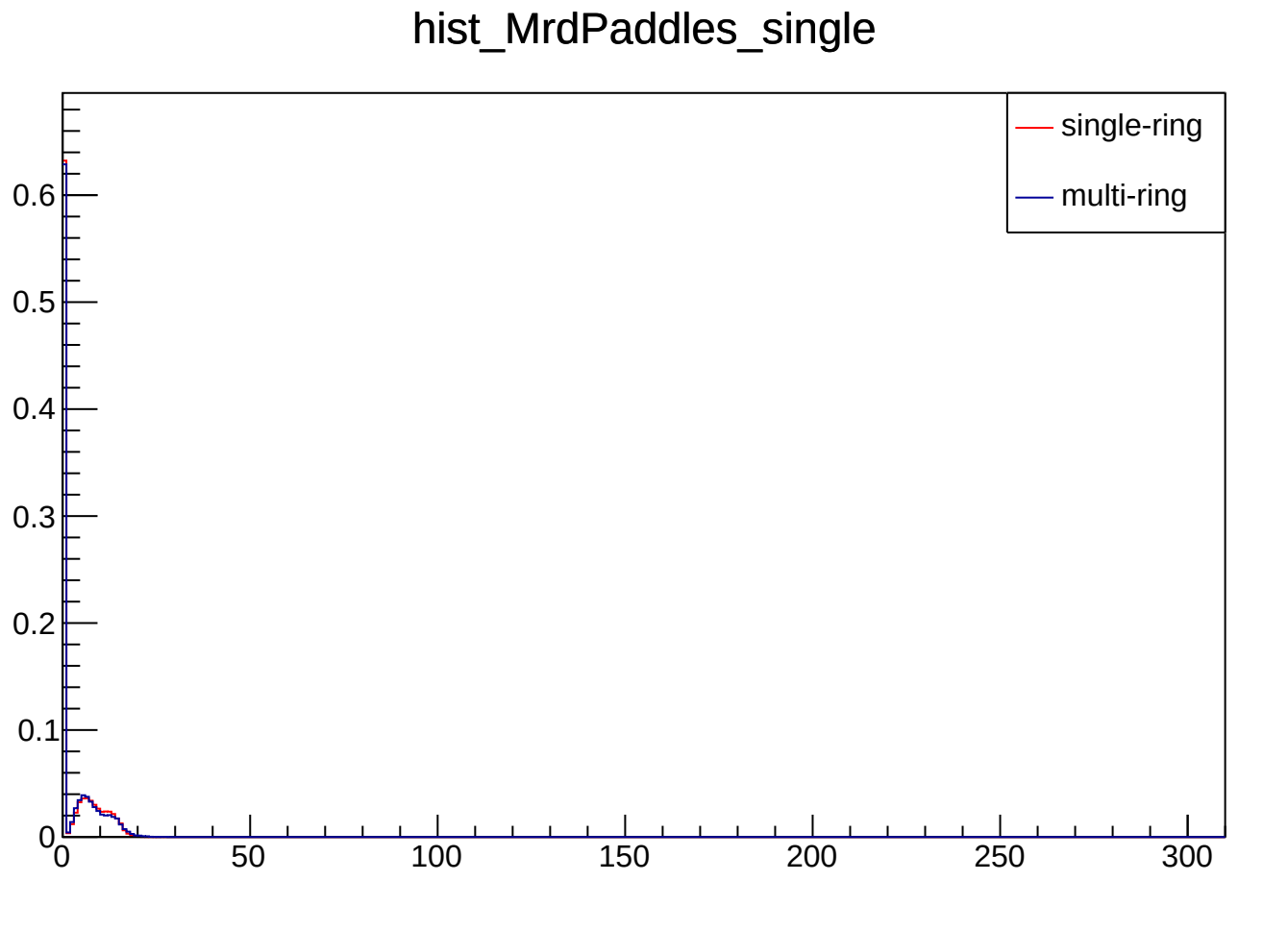

hist_LAPPDRMSTheta_single
single-ring
multi-ring
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3

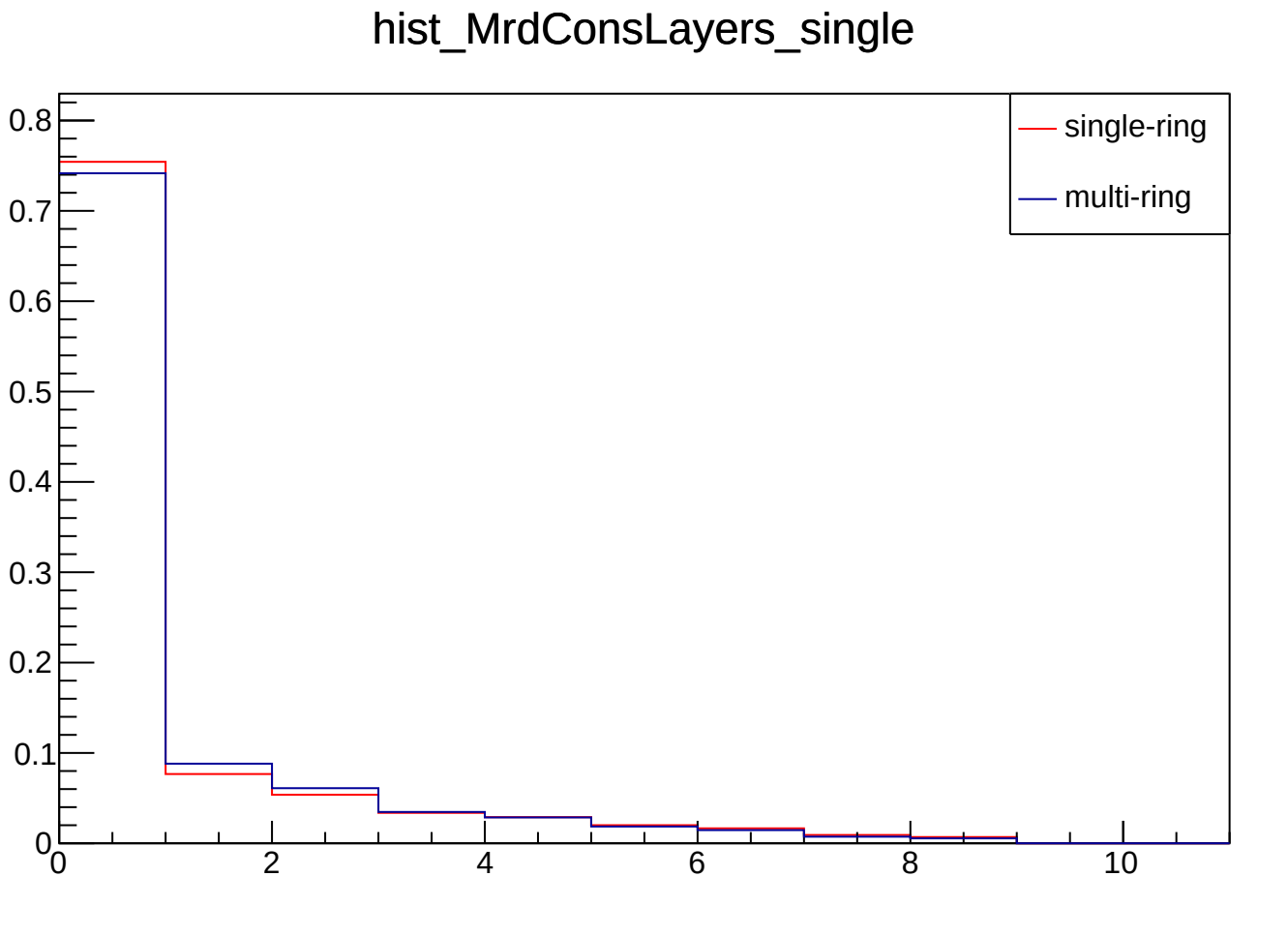

hist_LAPPDVarTheta_single
single-ring
multi-ring
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3

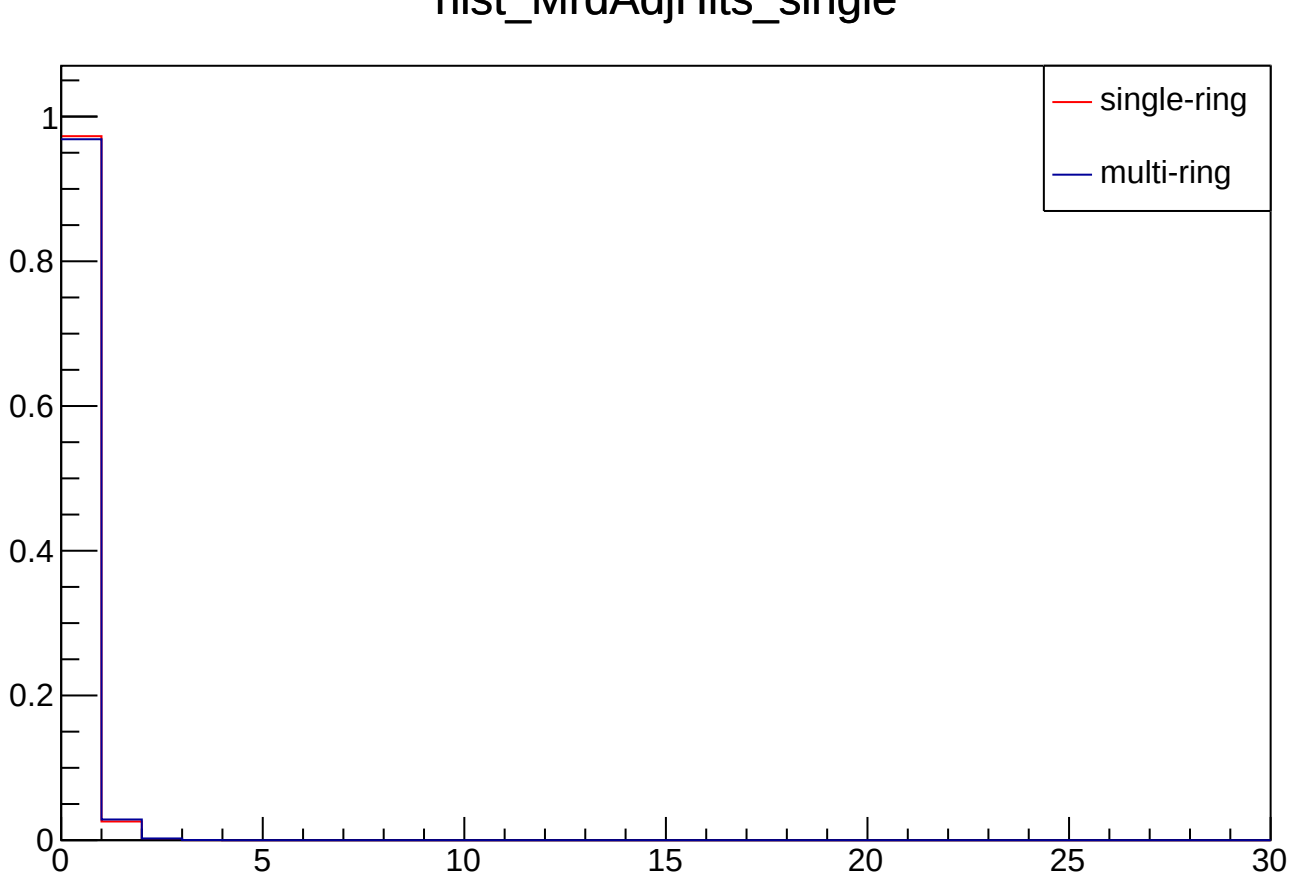

hist_LAPPDRMSThetaBary_single
single-ring
multi-ring
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3

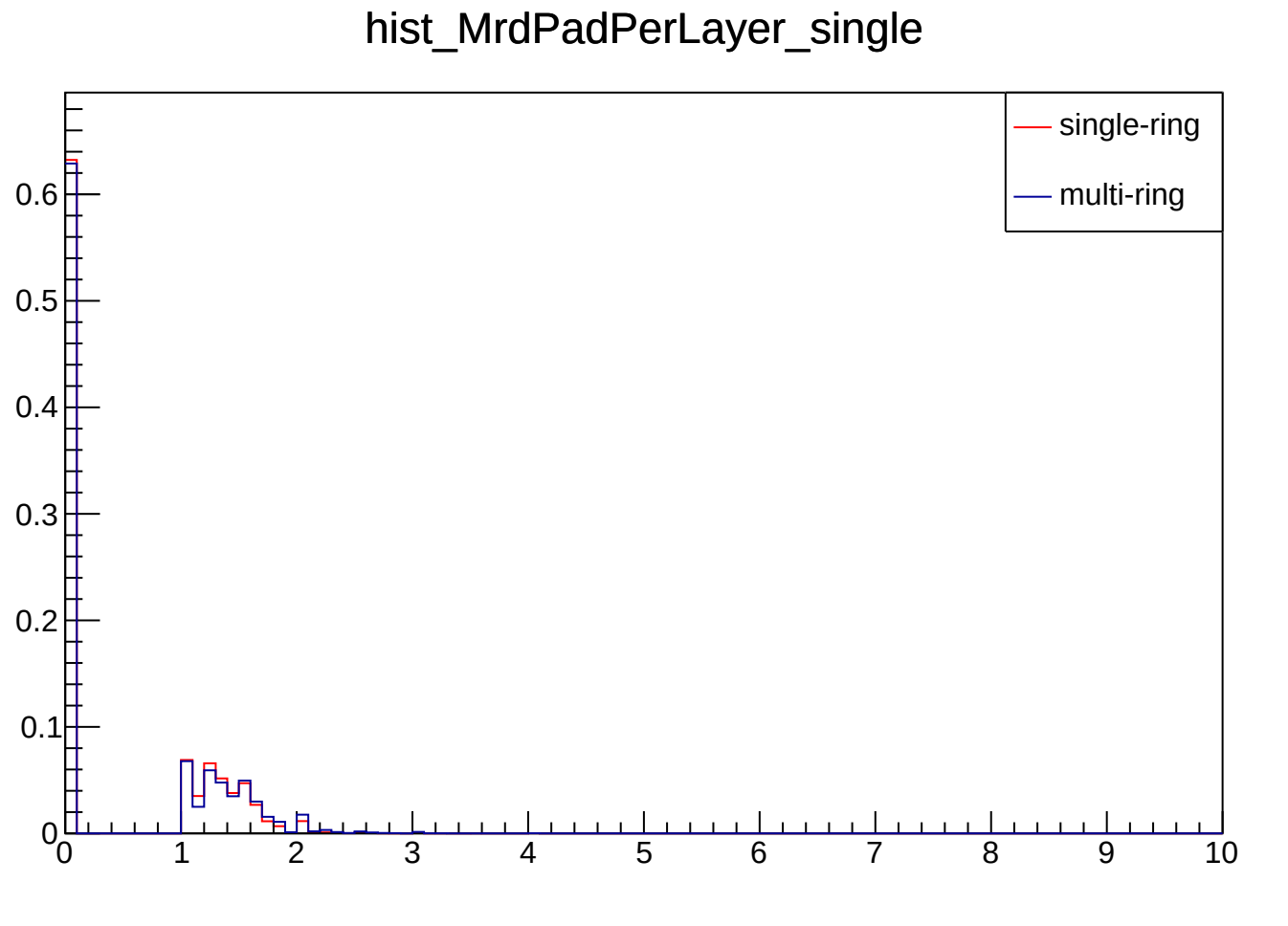

hist_LAPPDVarThetaBary_single
single-ring
multi-ring
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.5
1
1.5
2
2.5
3


hist_MrdLayers_single
single-ring
multi-ring
0.6
0.5
0.4
0.3
0.2
0.1
0
0
2
4
6
8
10


hist_MrdPaddles_single
single-ring
multi-ring
0.6
0.5
0.4
0.3
0.2
0.1
0
0
50
100
150
200
250
300


hist_MrdConsLayers_single
single-ring
multi-ring
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
2
4
6
8
10


hist_MrdAdjHits_single
single-ring
multi-ring
1
0.8
0.6
0.4
0.2
0
0
5
10
15
20
25
30


hist_MrdPadPerLayer_single
single-ring
multi-ring
0.6
0.5
0.4
0.3
0.2
0.1
0
0
1
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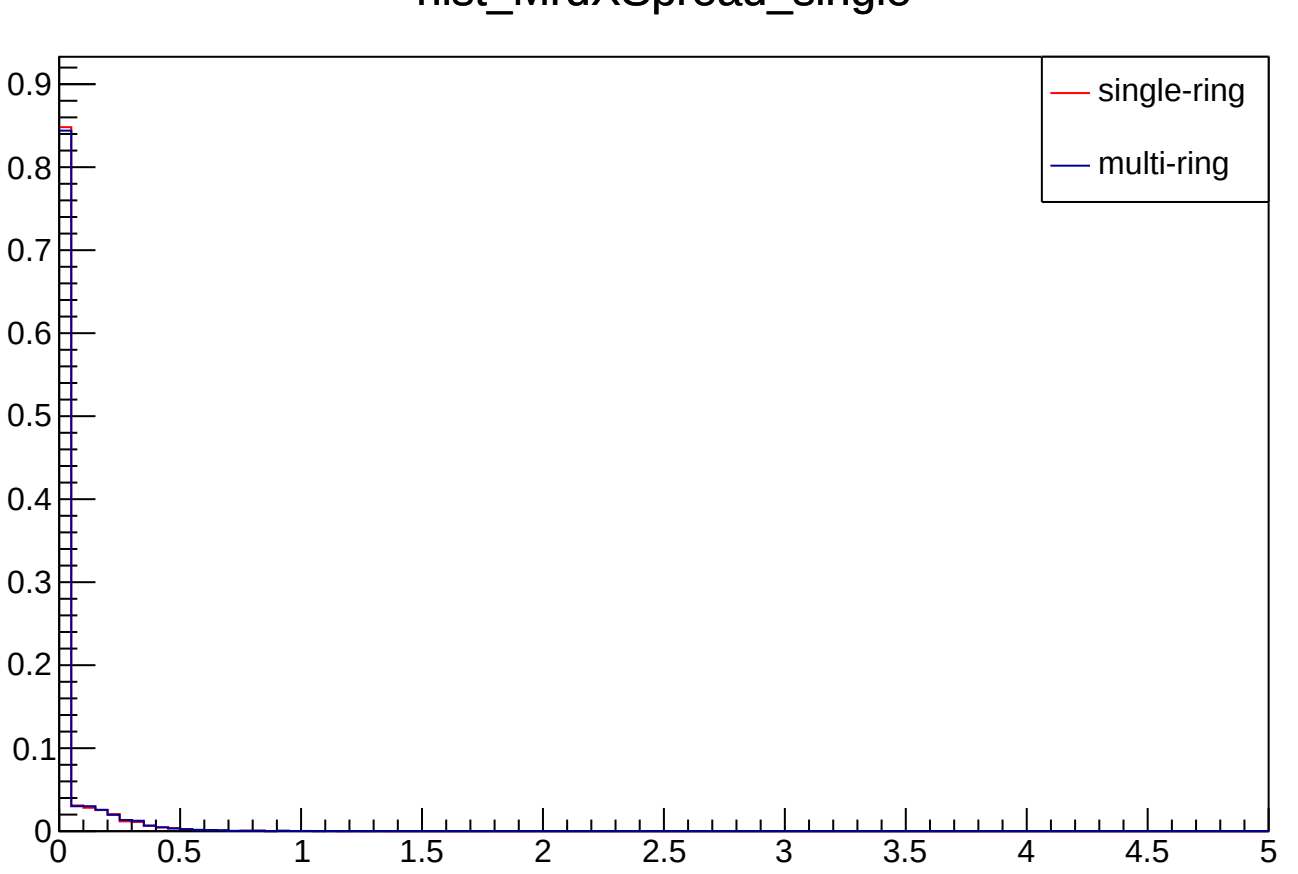
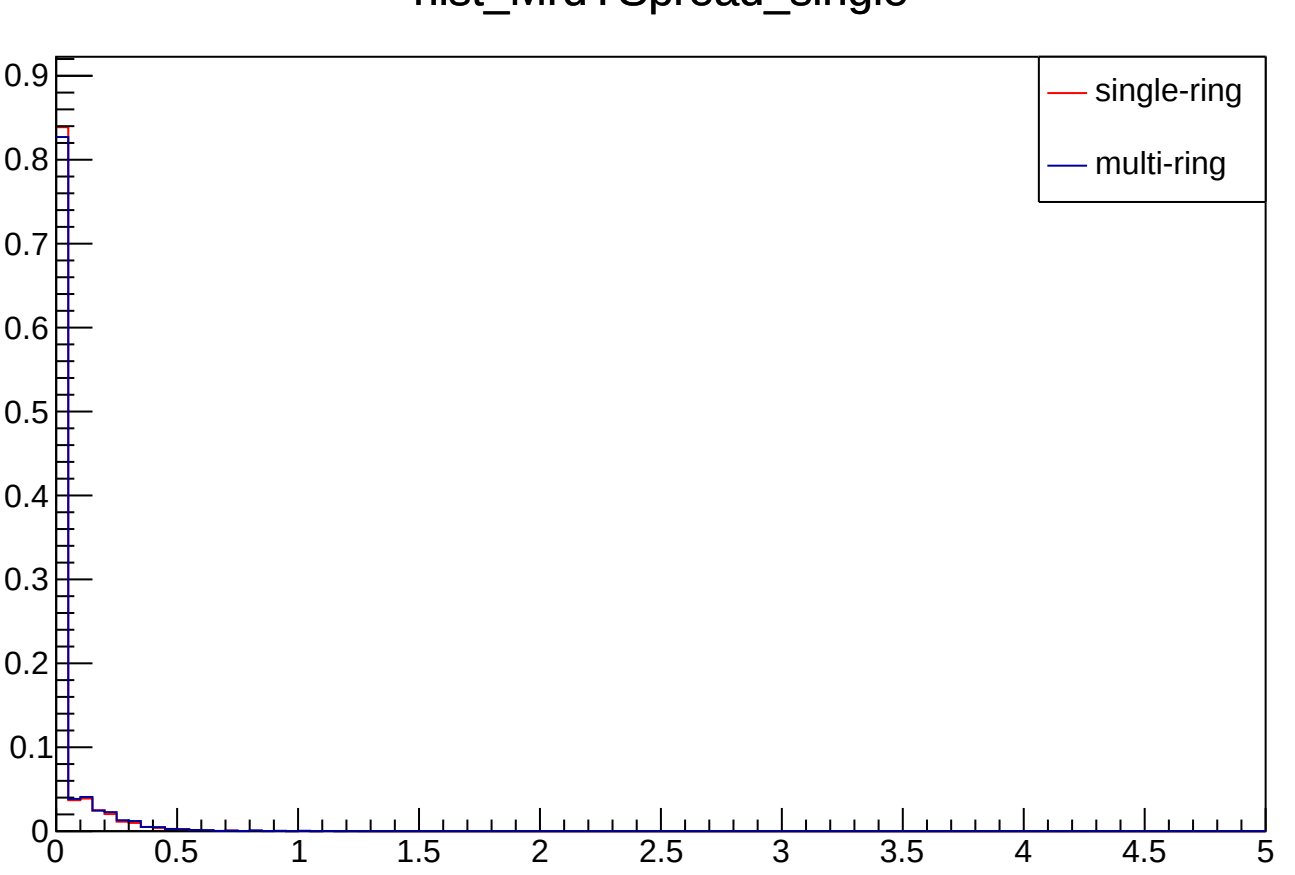
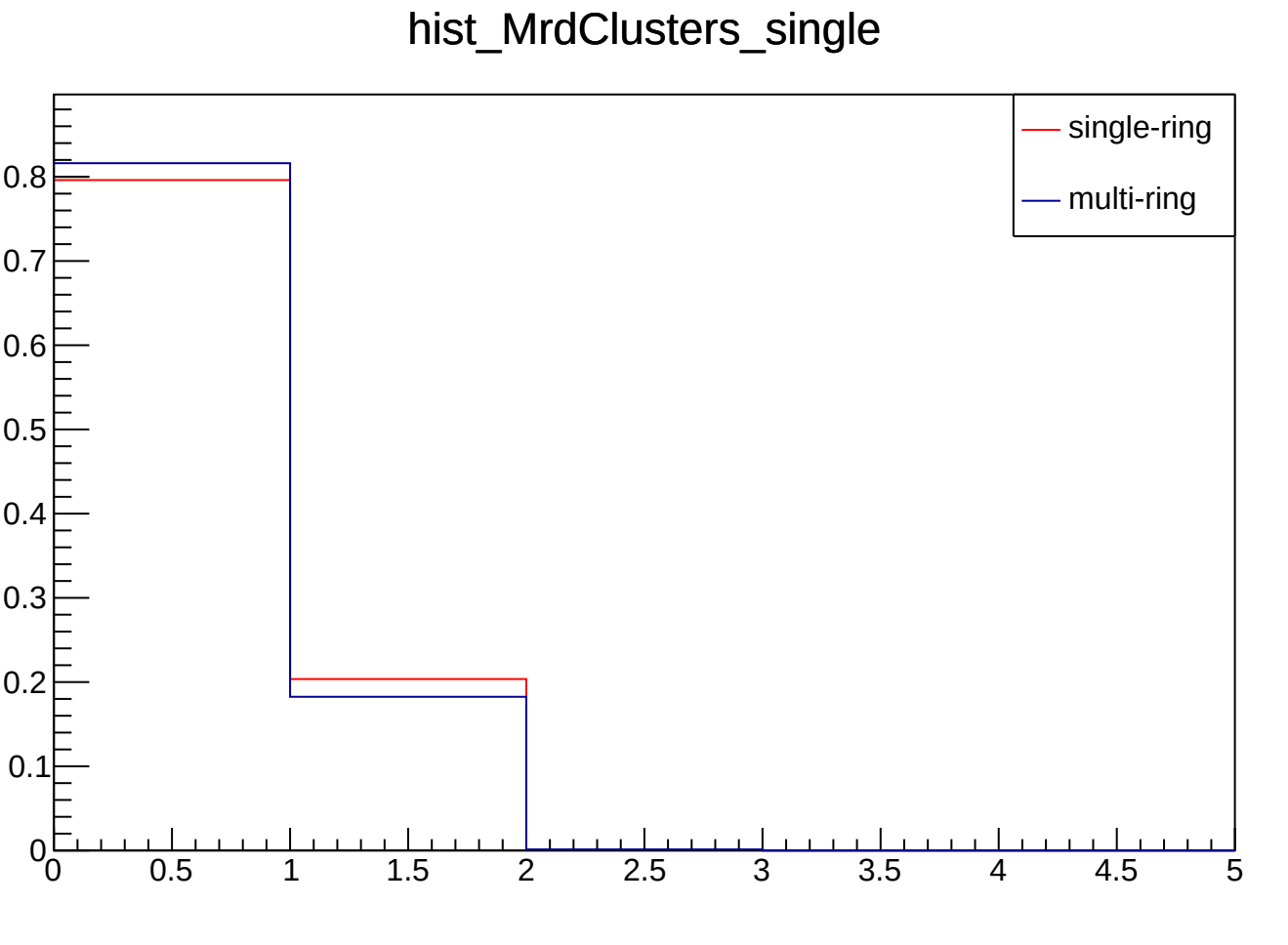
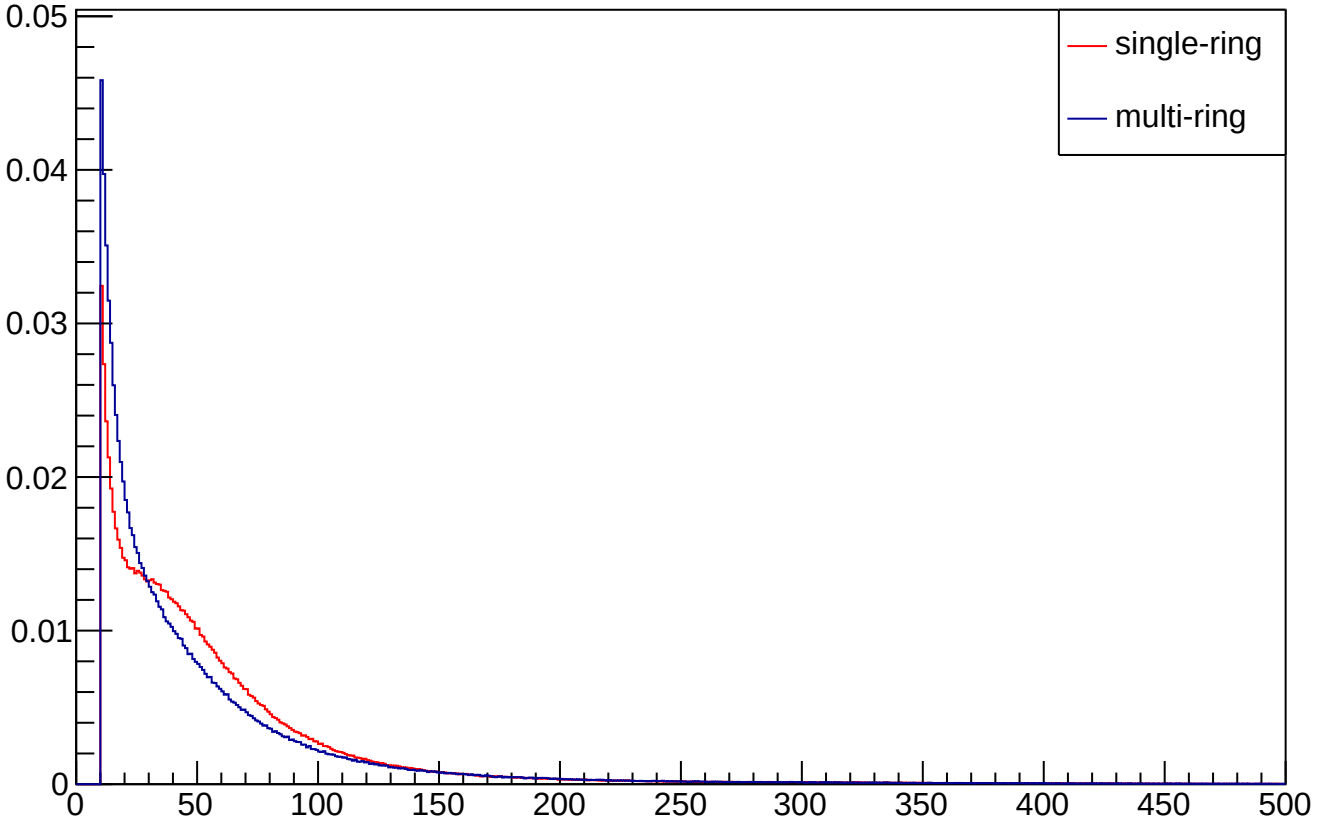
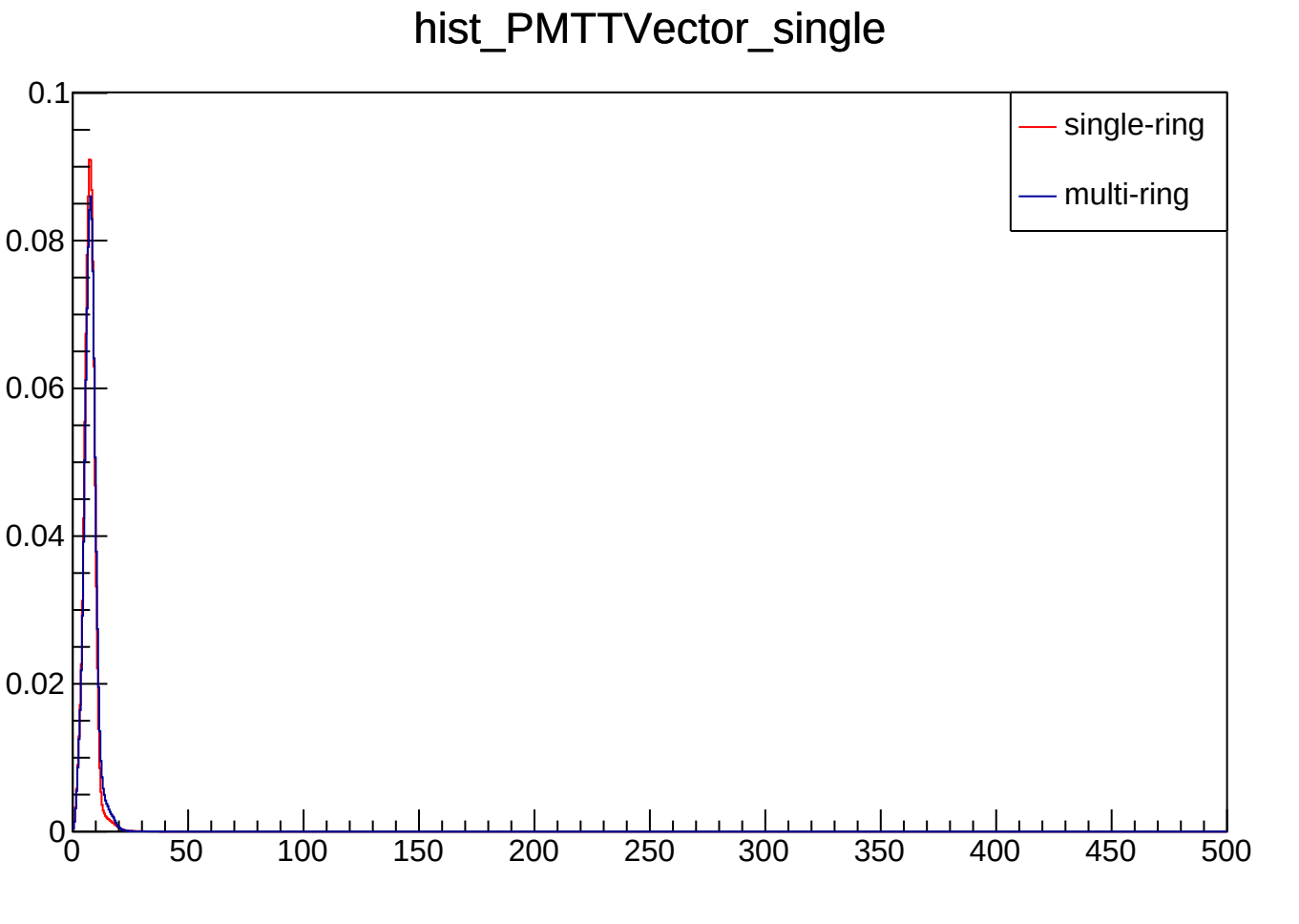
3
4
5
6
7
8
9
10


hist_MrdXSpread_single
single-ring
multi-ring
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5


hist_MrdYSpread_single
single-ring
multi-ring
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5


hist_MrdClusters_single
single-ring
multi-ring
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5


hist_PMTQVector_single
single-ring
multi-ring
0.05
0.04
0.03
0.02
0.01
0
0
50
100
150
200
250
300
350
400
450
500


hist_PMTTVector_single
single-ring
multi-ring
0.1
0.08
0.06
0.04
0.02
0
0
50
100
150
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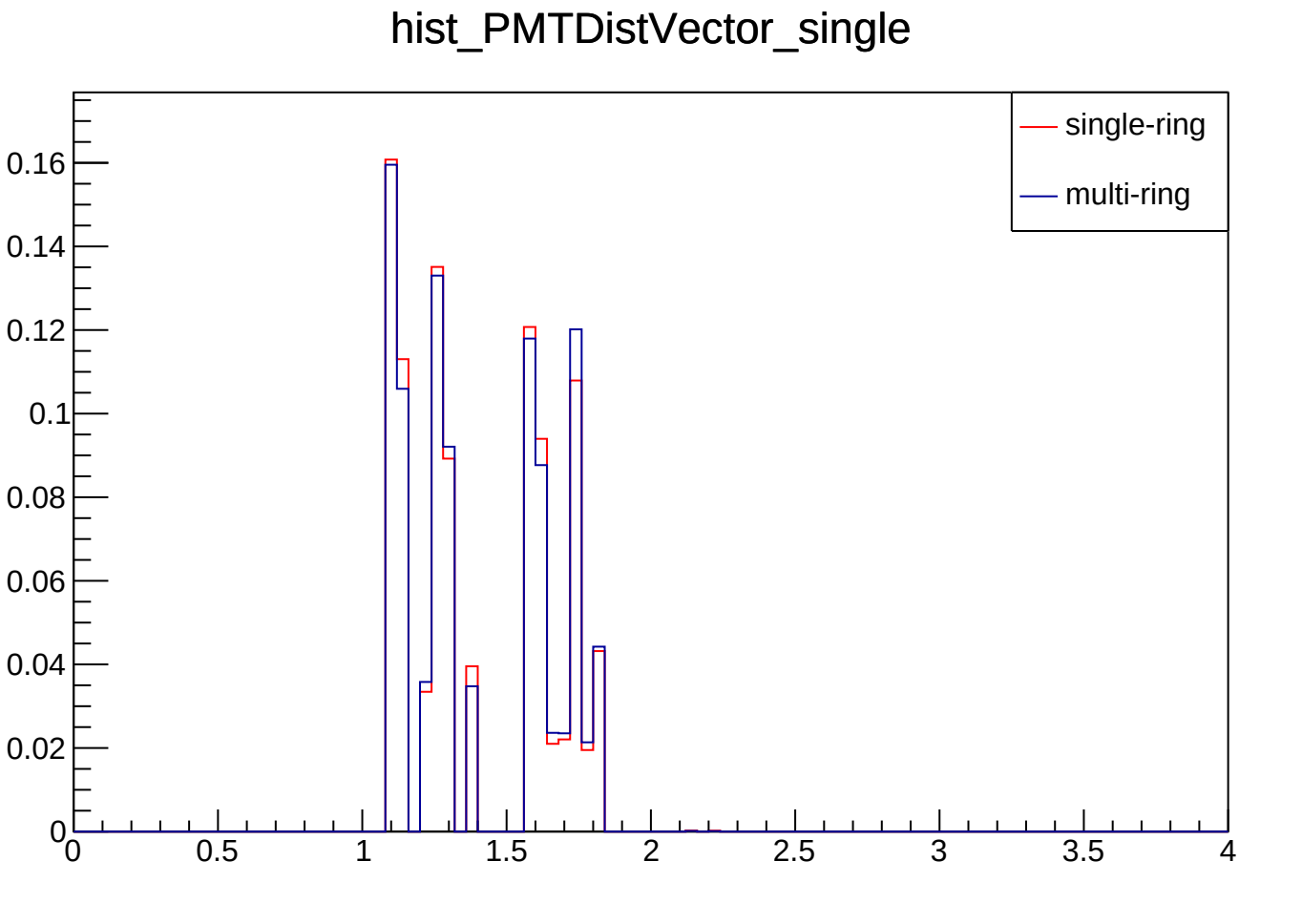
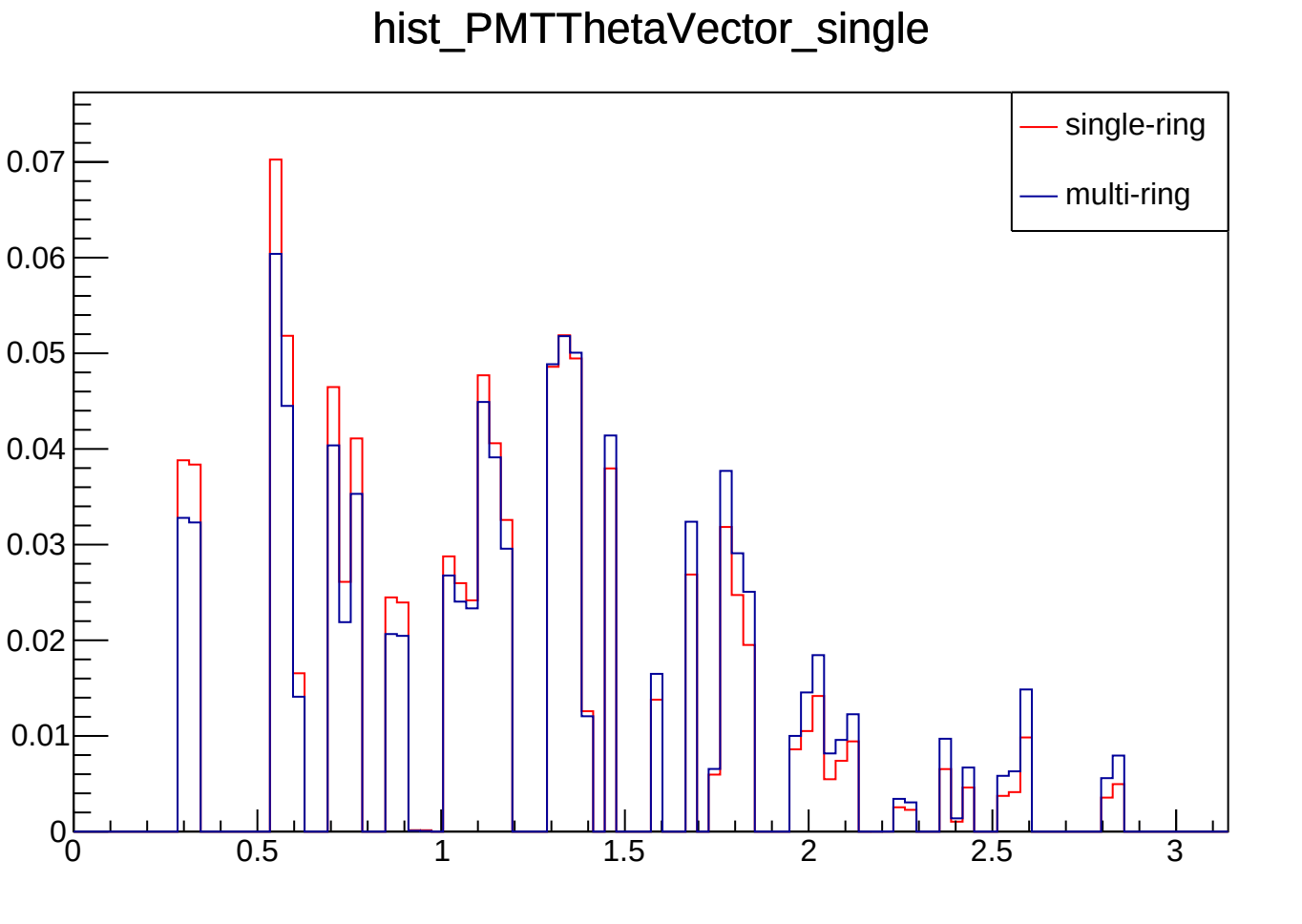
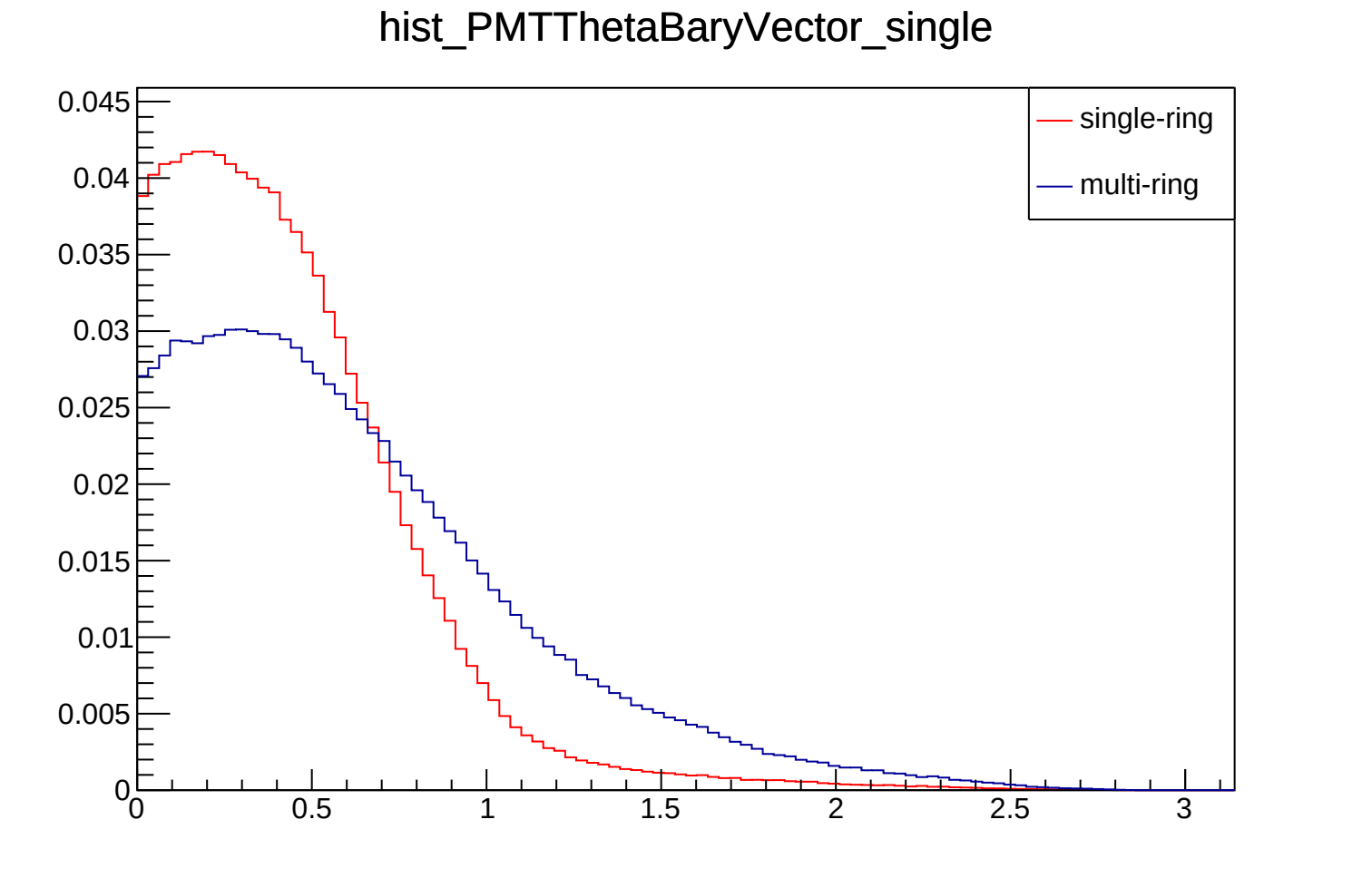
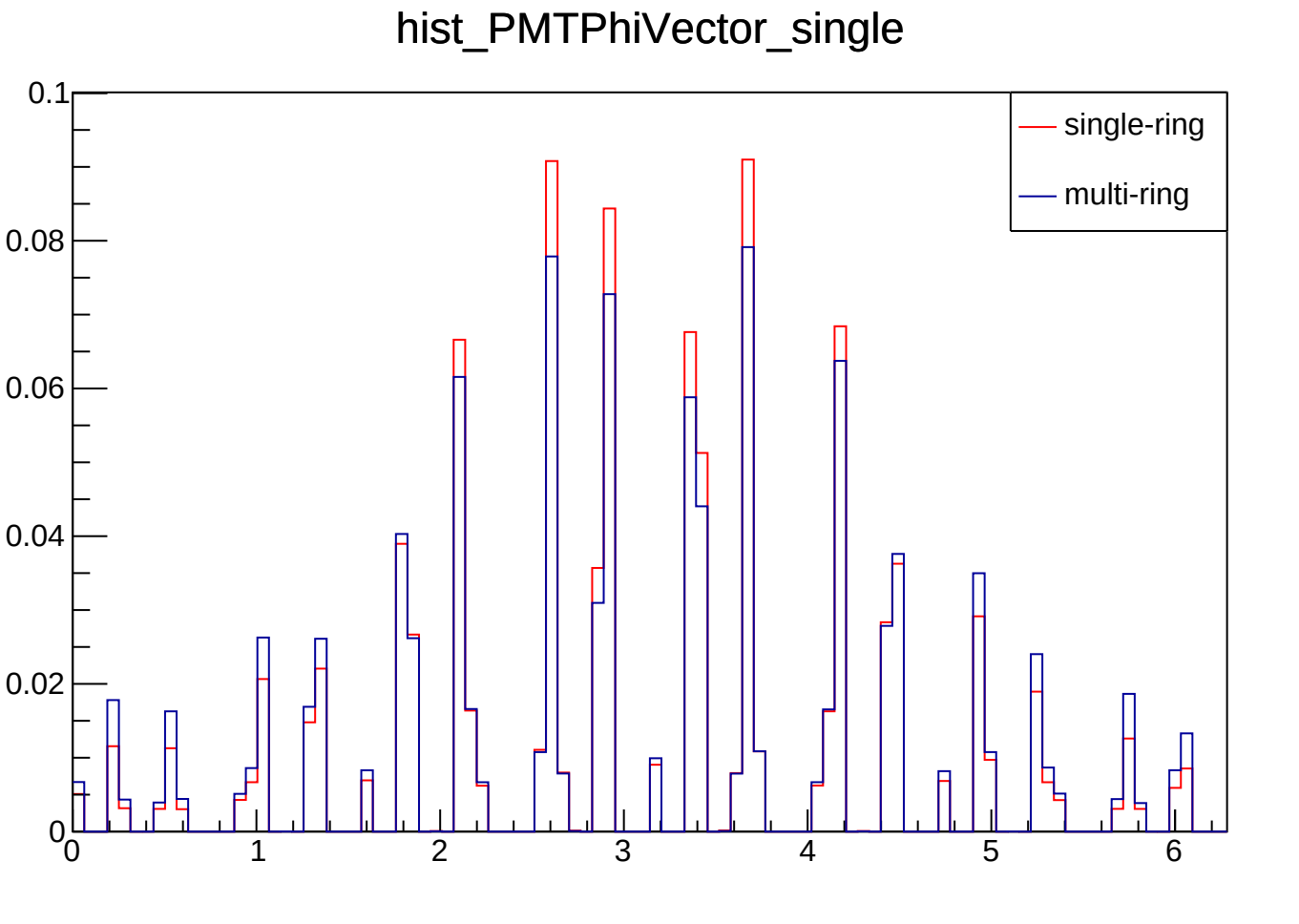
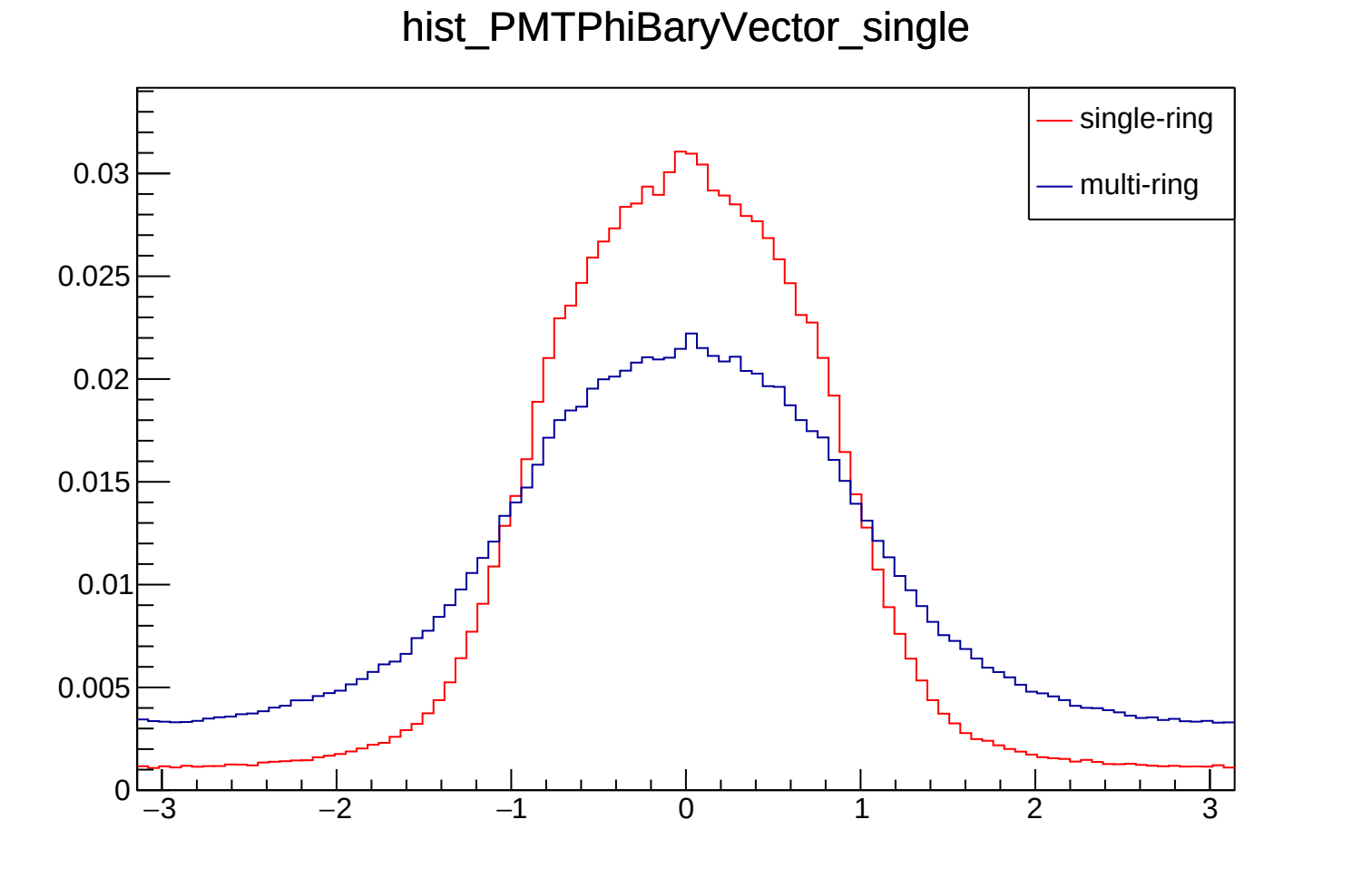
300
350
400
450
500

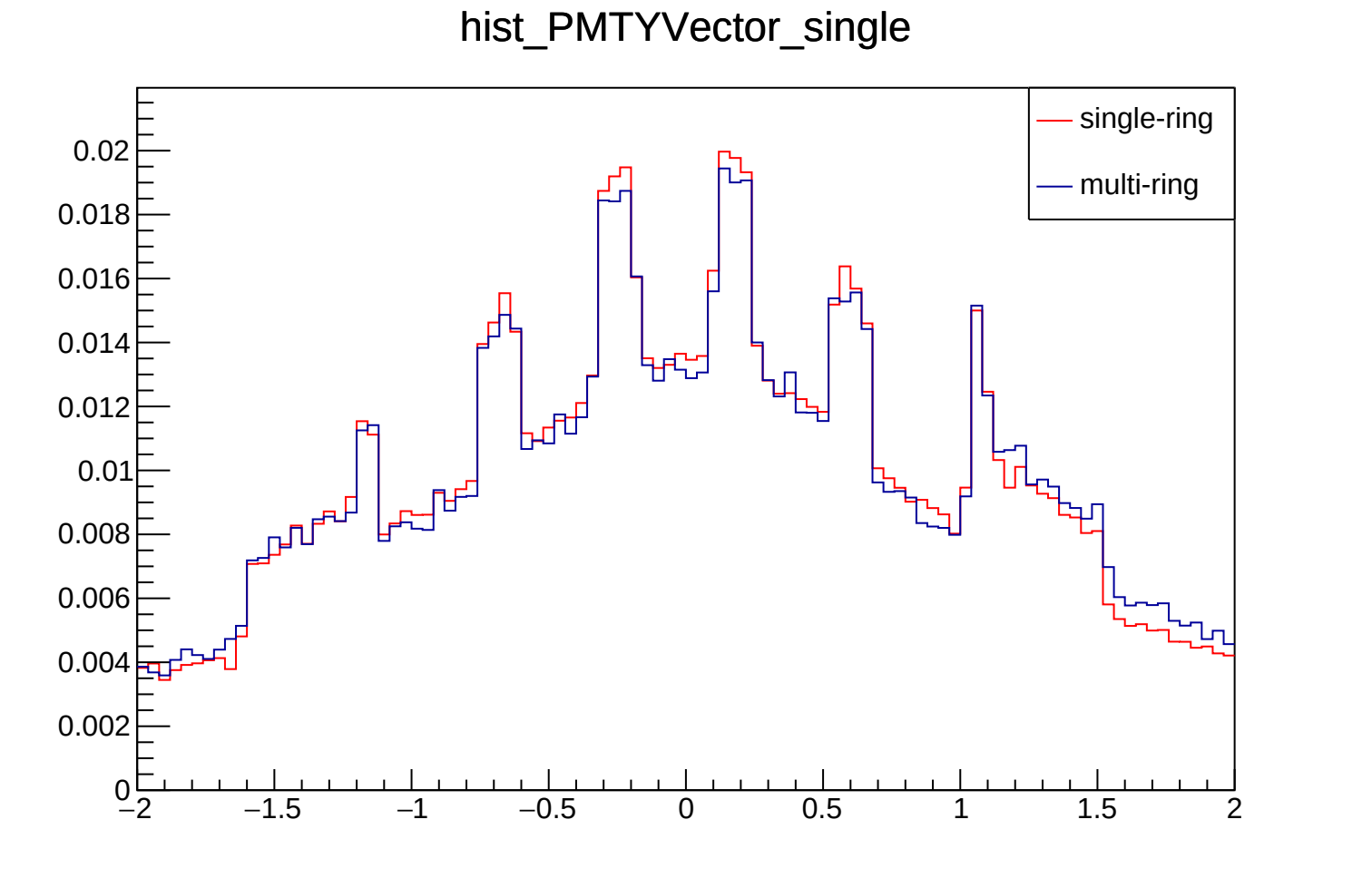

hist_PMTDistVector_single
single-ring
multi-ring
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3
3.5
4

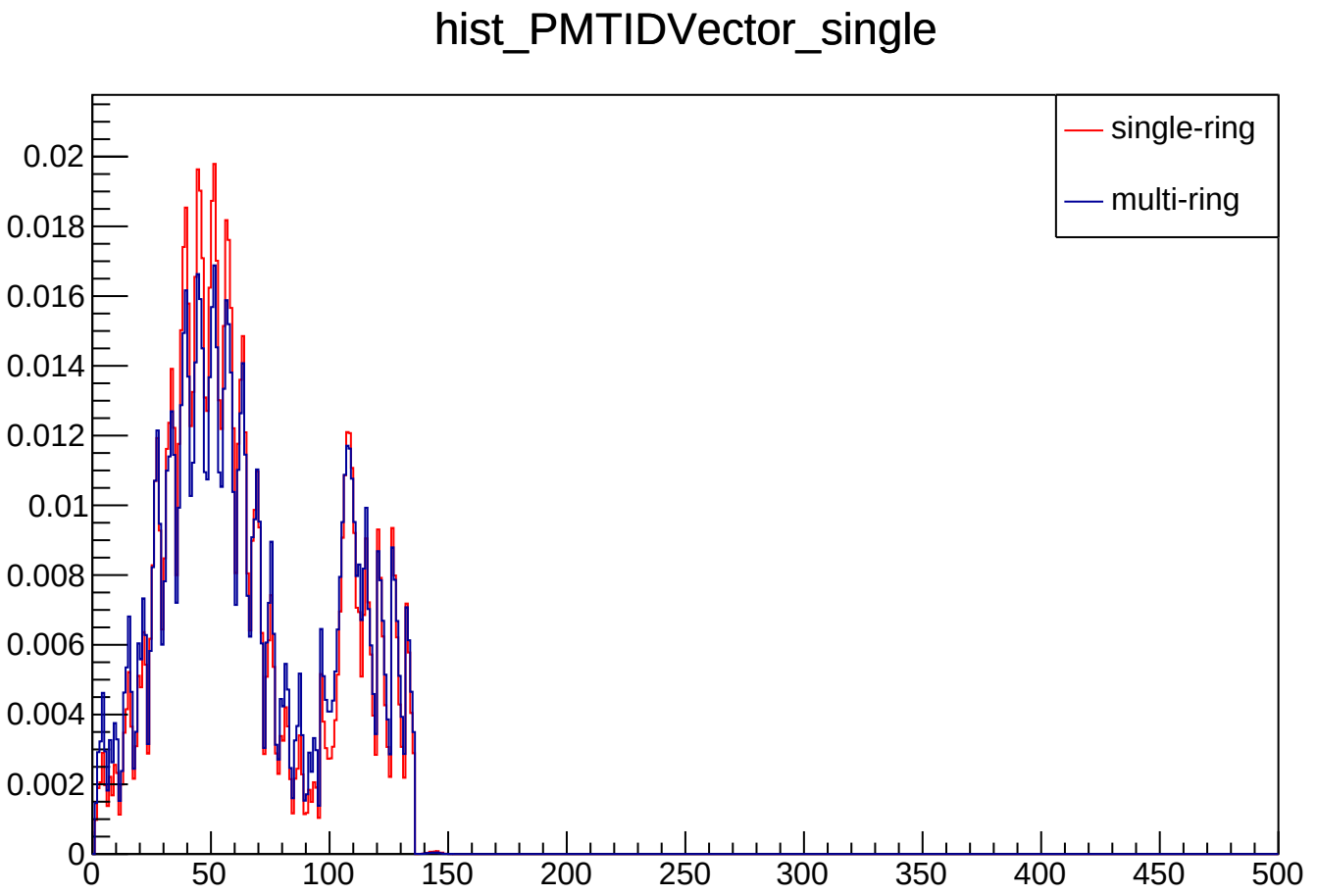

hist_PMTThetaVector_single
single-ring
multi-ring
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
0.5
1
1.5
2
2.5
3

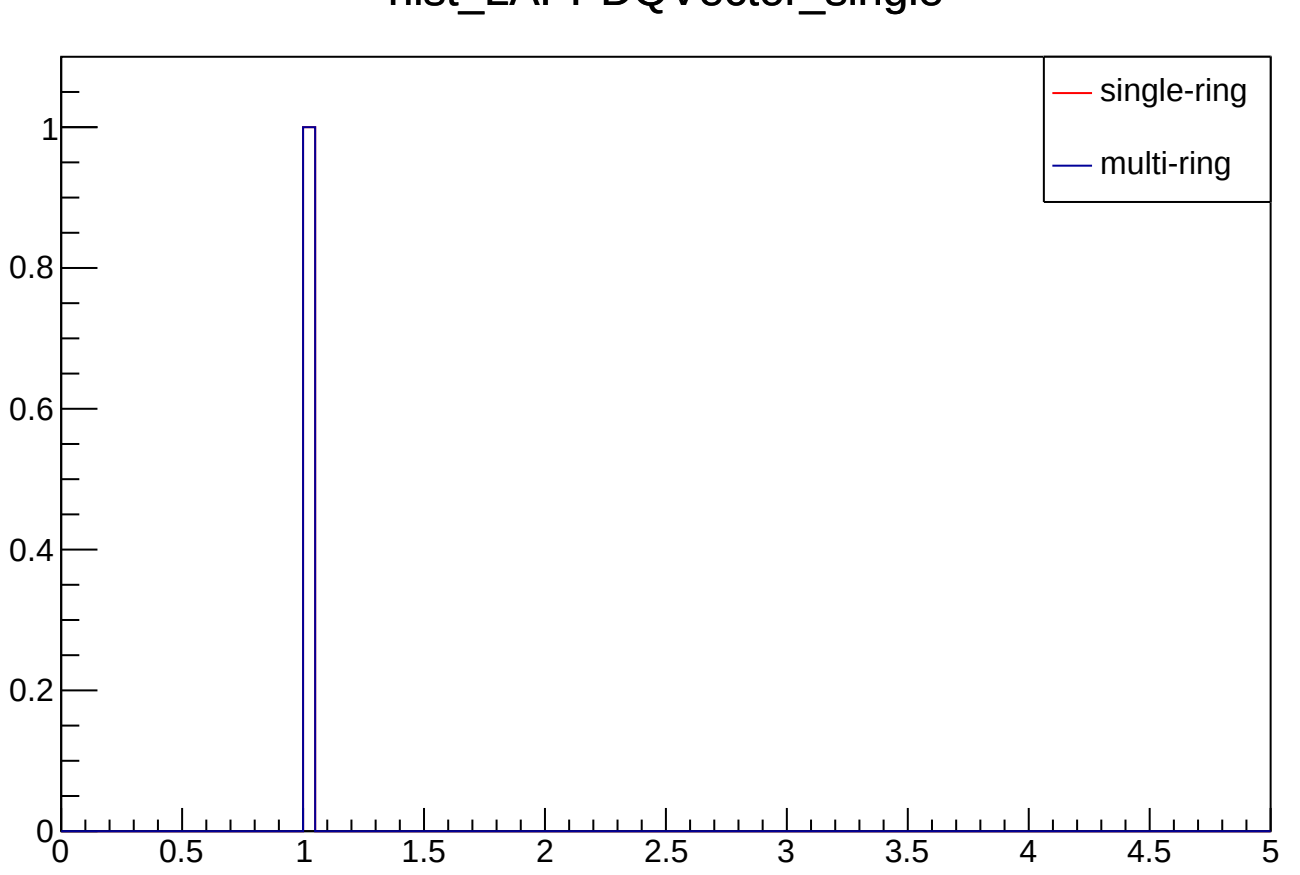

hist_PMTThetaBaryVector_single
single-ring
multi-ring
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
0.5
1
1.5
2
2.5
3

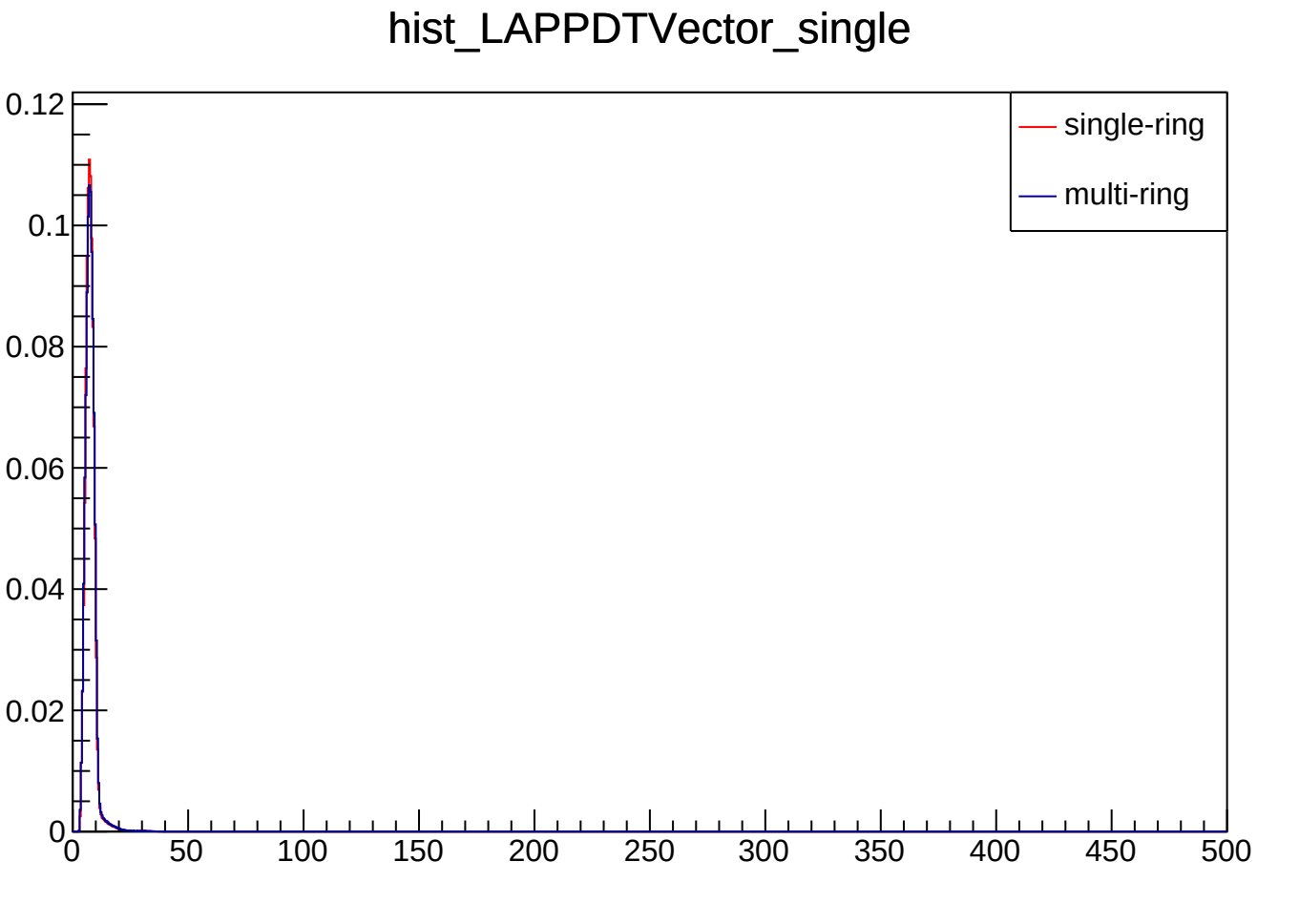

hist_PMTPhiVector_single
single-ring
multi-ring
0.1
0.08
0.06
0.04
0.02
0
0
1
2
3
4
5
6


hist_PMTPhiBaryVector_single
single-ring
multi-ring
0.03
0.025
0.02
0.015
0.01
0.005
0
−3
−2
−1
0
1
2
3


hist_PMTYVector_single
single-ring
multi-ring
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2


hist_PMTIDVector_single
single-ring
multi-ring
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
0
50
100
150
200
250
300
350
400
450
500


hist_LAPPDQVector_single
single-ring
multi-ring
1
0.8
0.6
0.4
0.2
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5


hist_LAPPDTVector_single
single-ring
multi-ring
0.12
0.1
0.08
0.06
0.04
0.02
0
0
50
100
150
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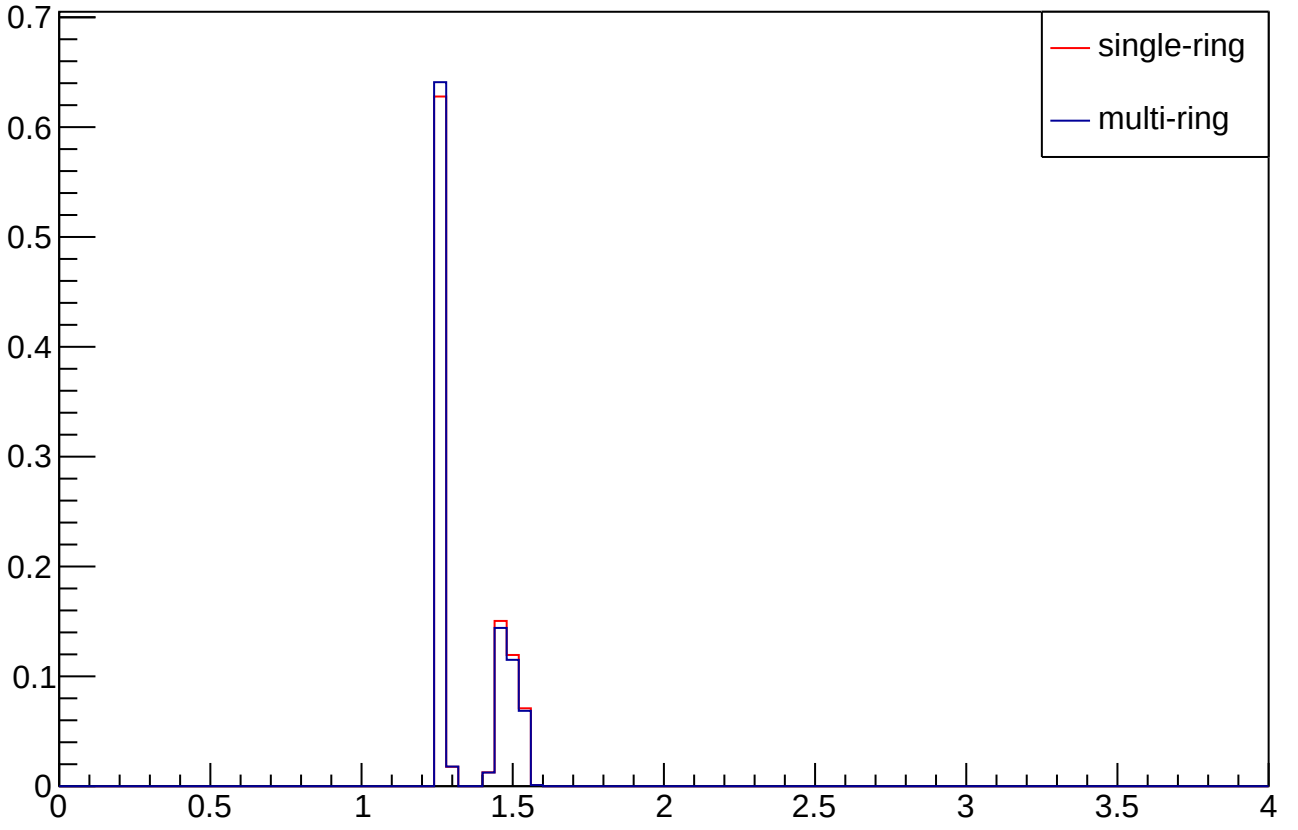
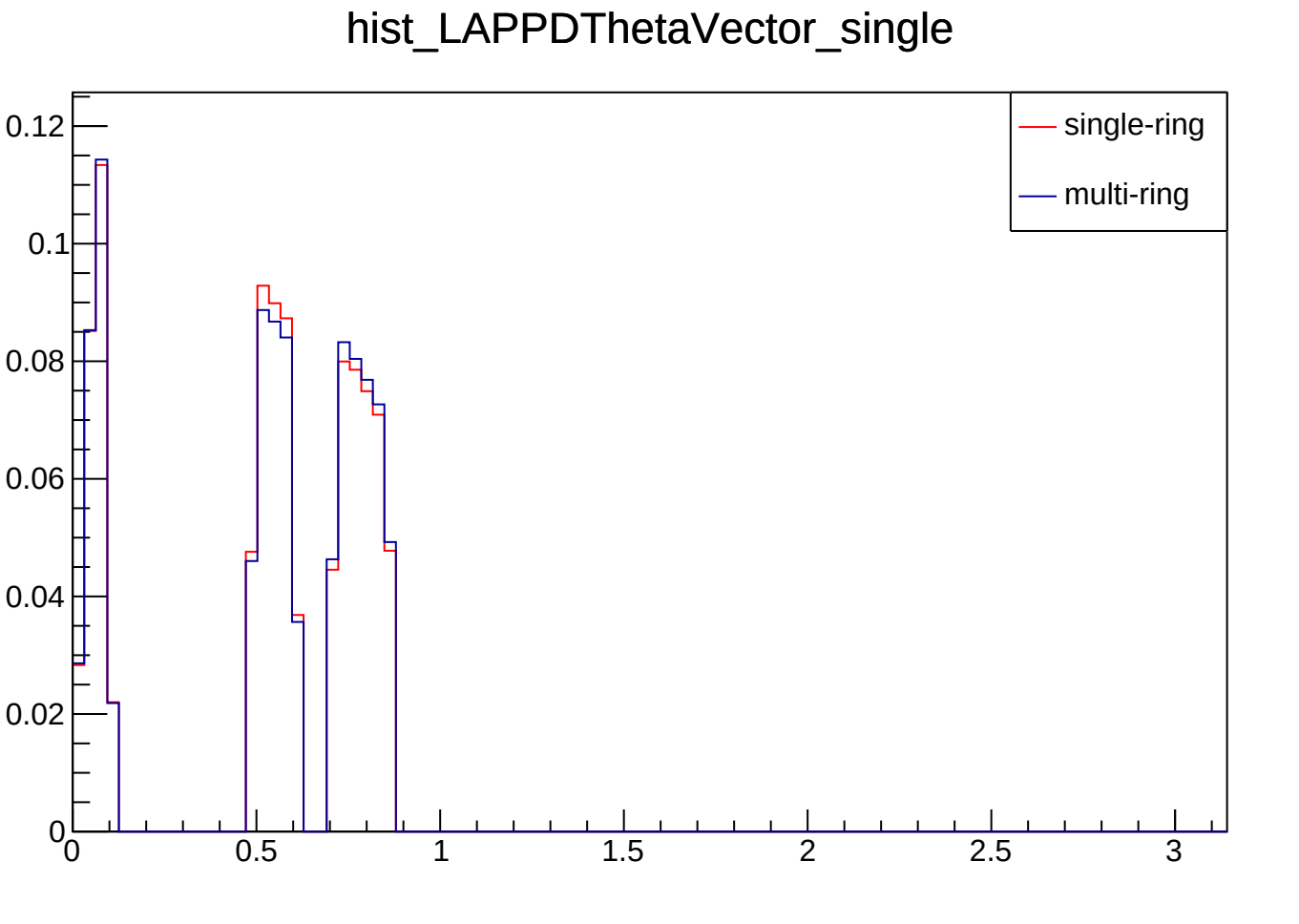
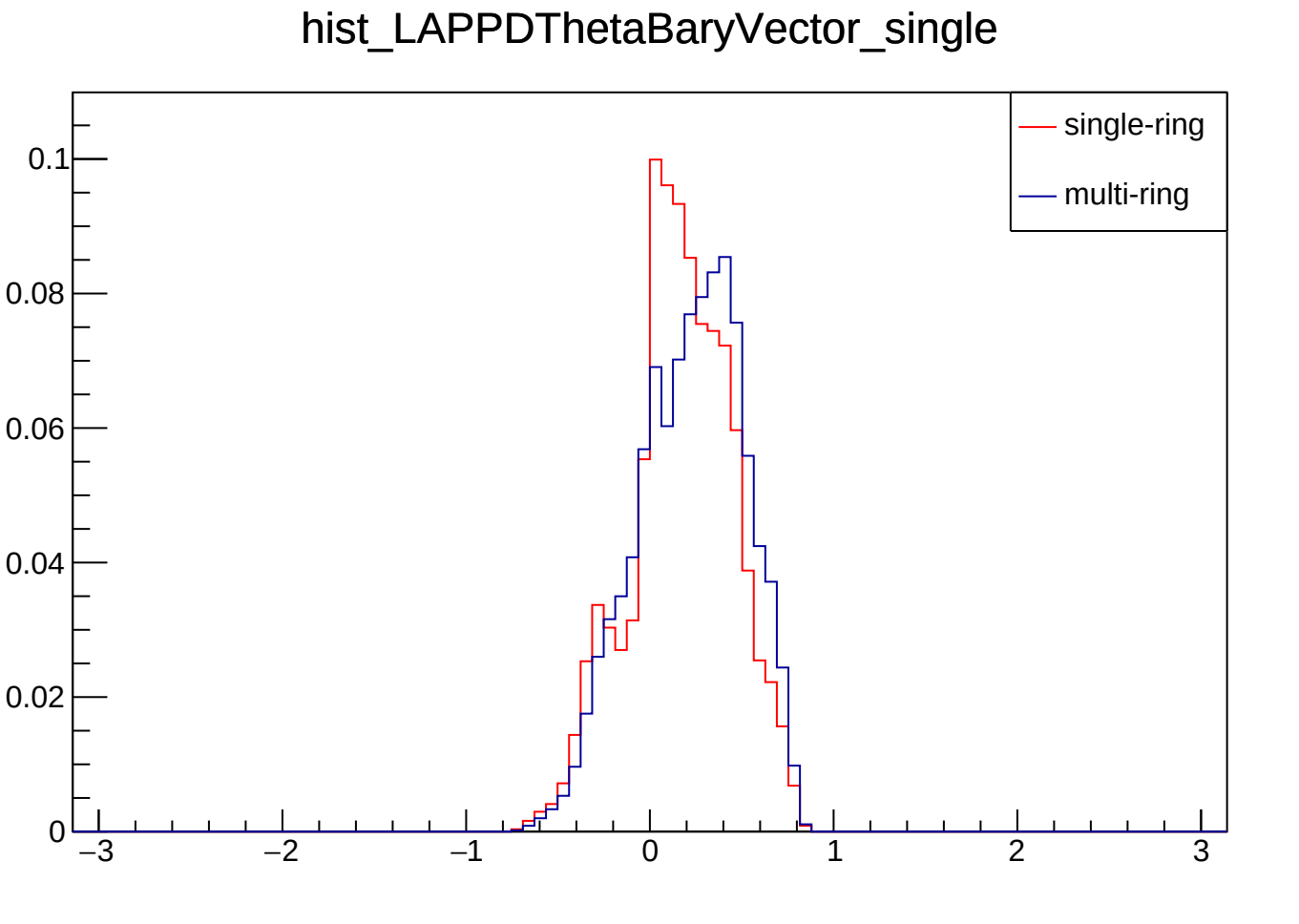
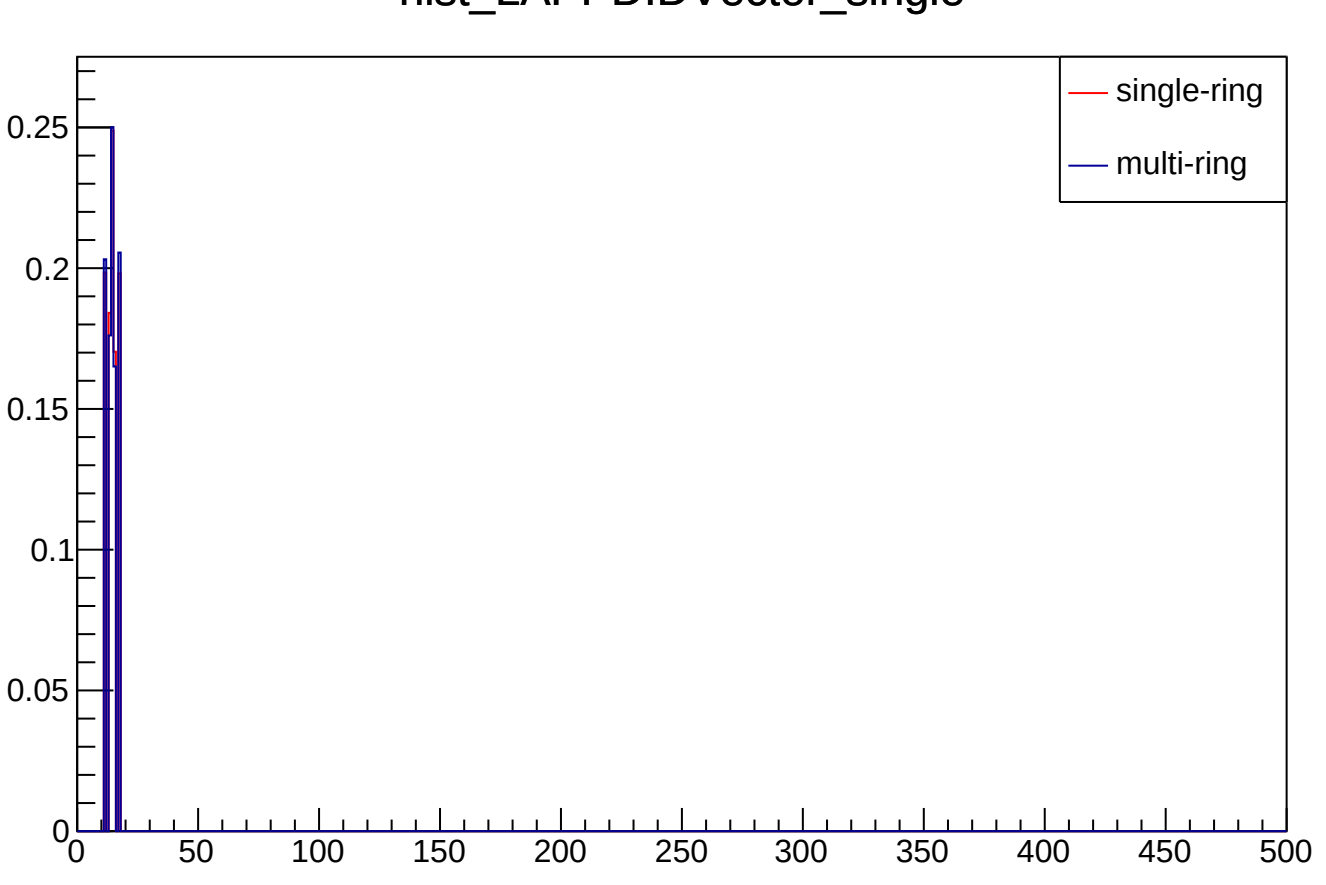
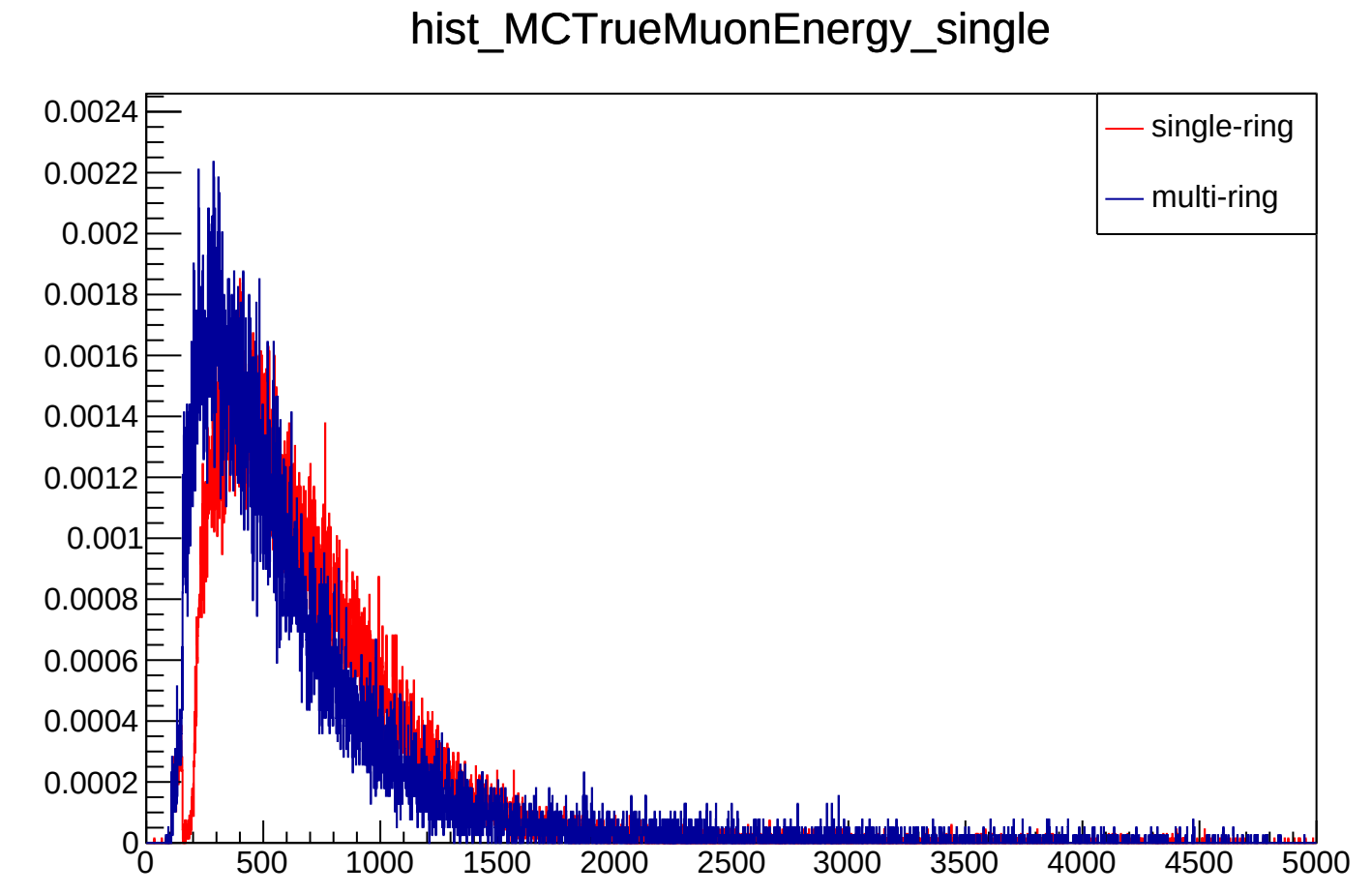
300
350
400
450
500

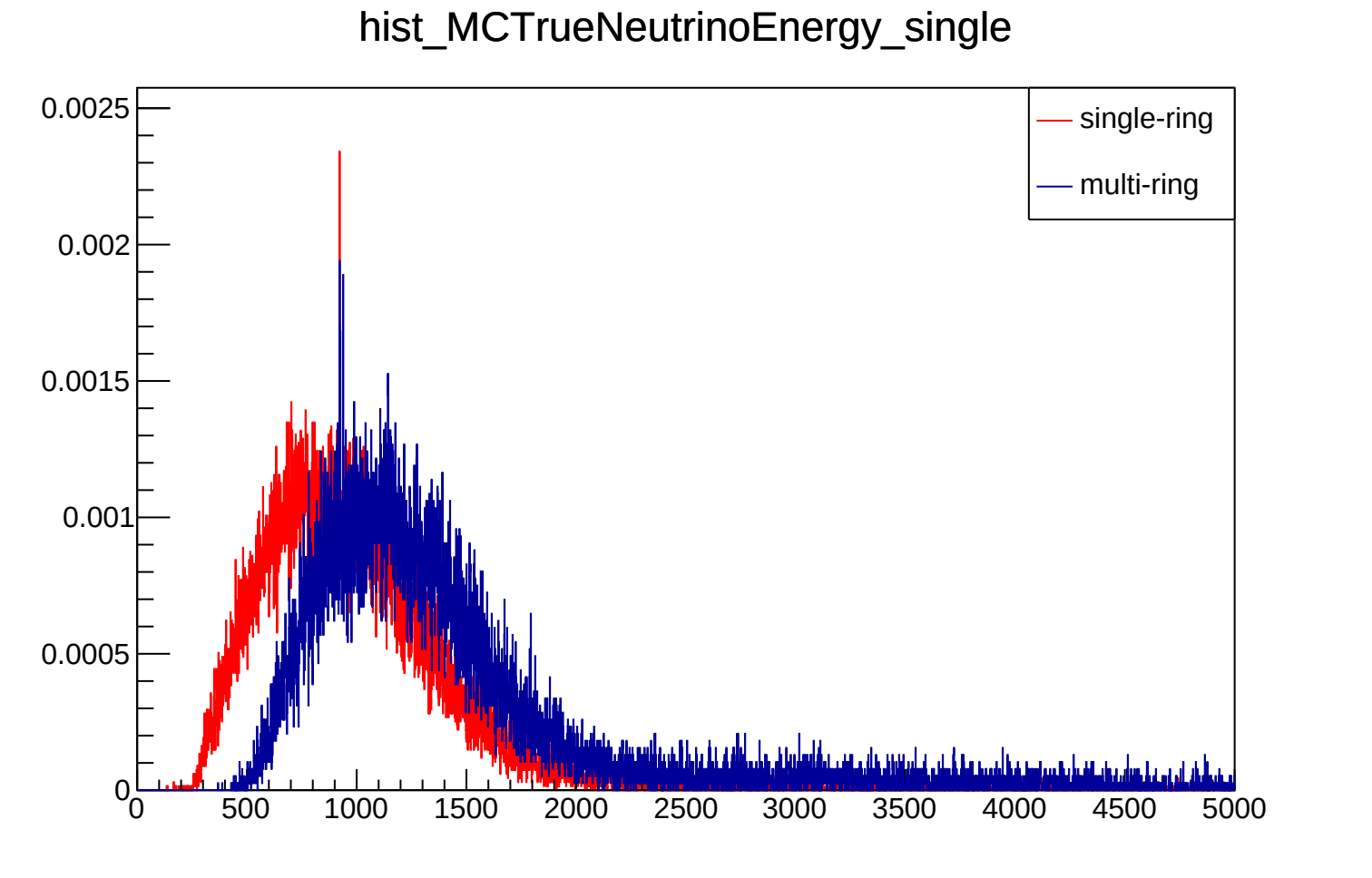

hist_LAPPDDistVector_single
single-ring
multi-ring
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.5
1
1.5
2
2.5
3
3.5
4

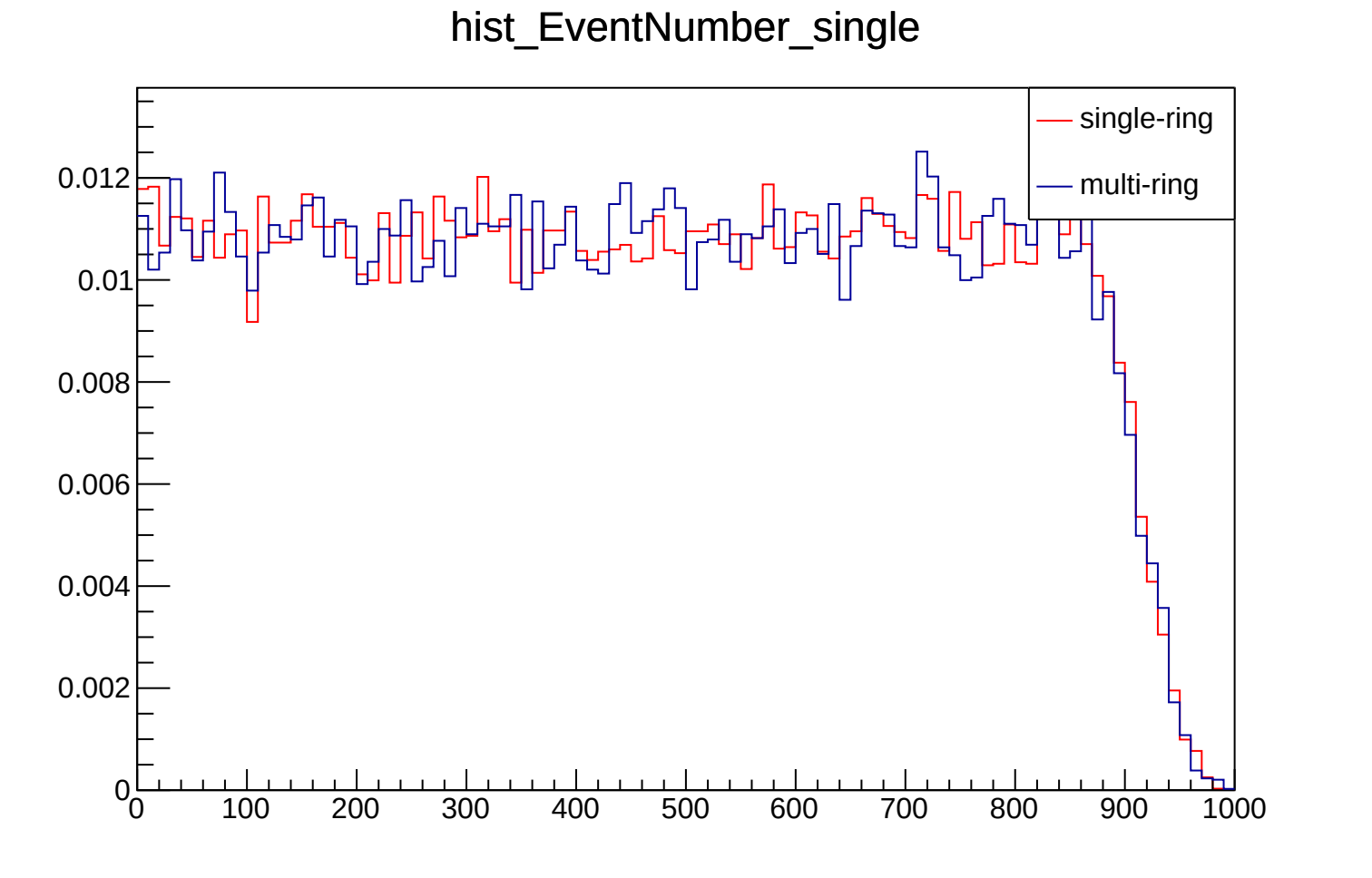

hist_LAPPDThetaVector_single
single-ring
multi-ring
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3

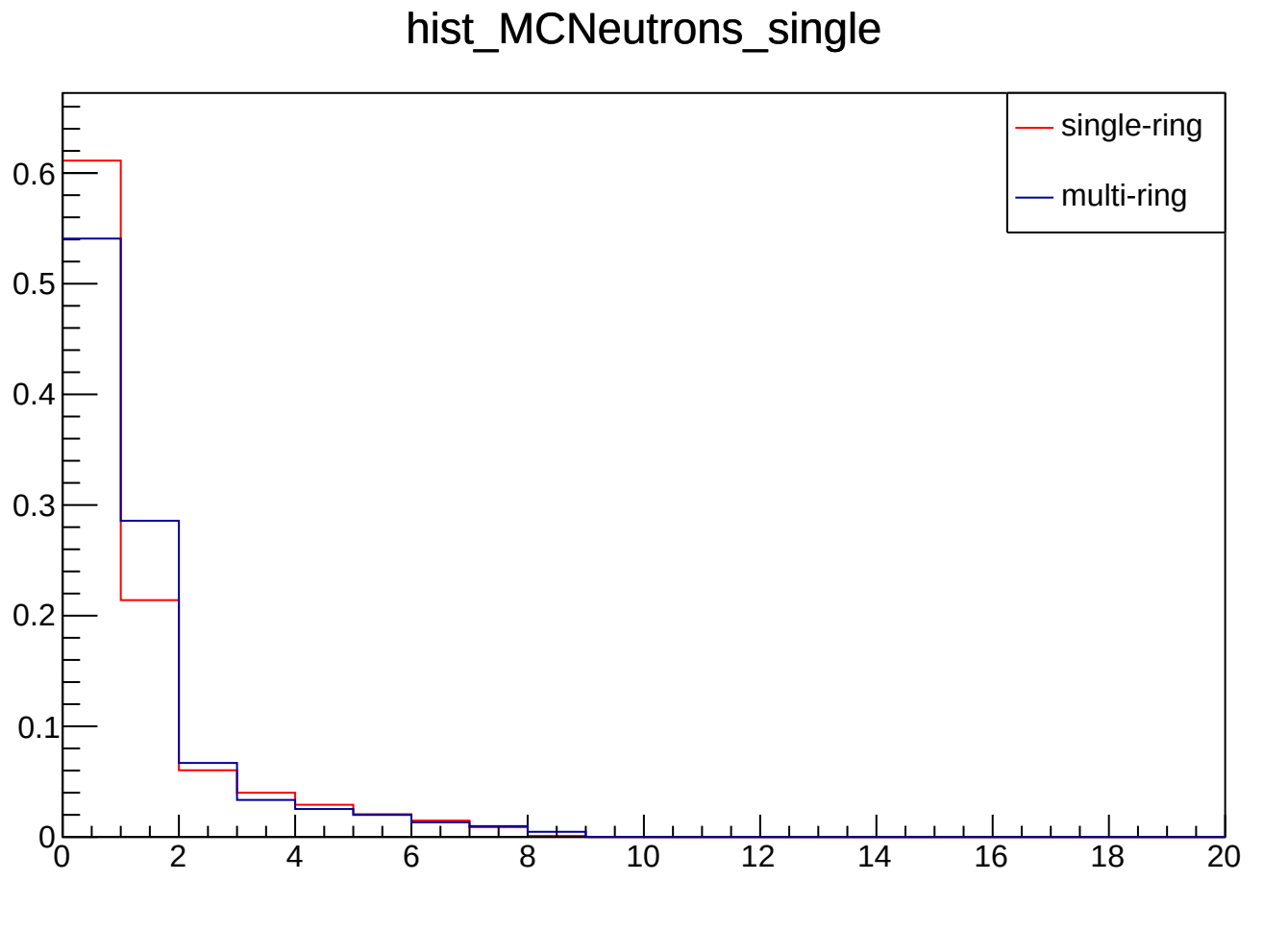

hist_LAPPDThetaBaryVector_single
single-ring
multi-ring
0.1
0.08
0.06
0.04
0.02
0
−3
−2
−1
0
1
2
3

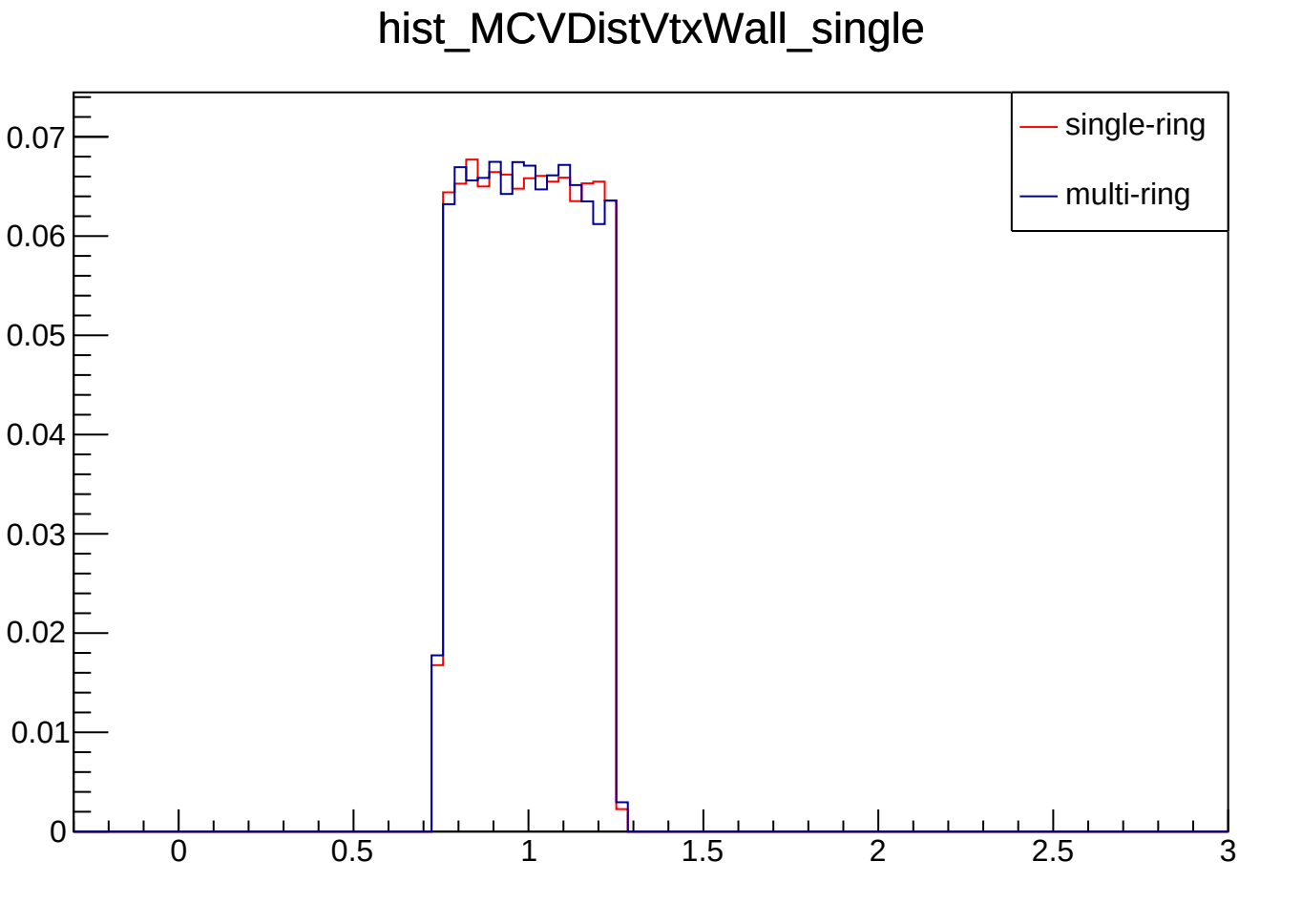

hist_LAPPDIDVector_single
single-ring
multi-ring
0.25
0.2
0.15
0.1
0.05
0
0
50
100
150
200
250
300
350
400
450
500

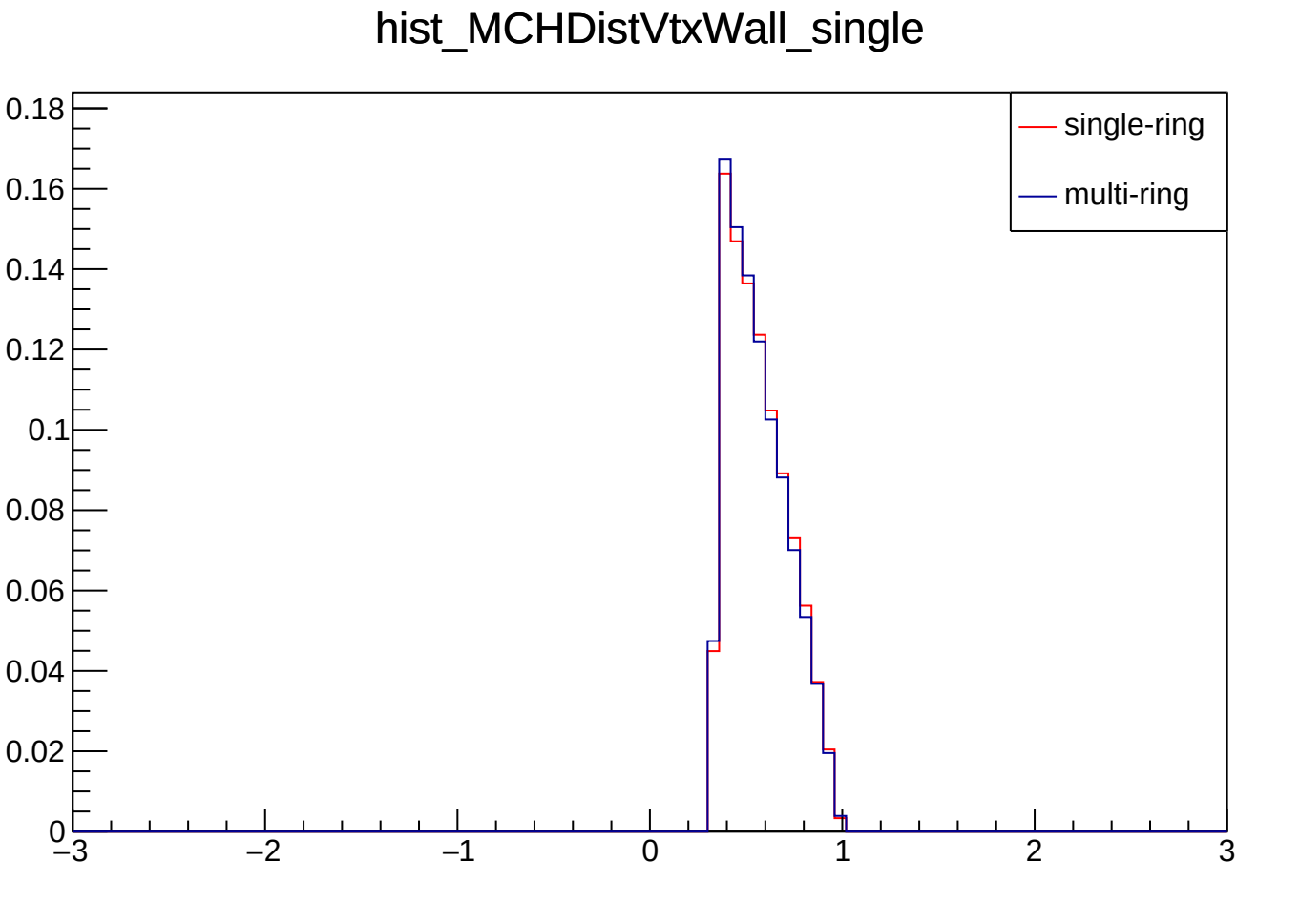

hist_MCTrueMuonEnergy_single
single-ring
multi-ring
0.0024
0.0022
0.002
0.0018
0.0016
0.0014
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000

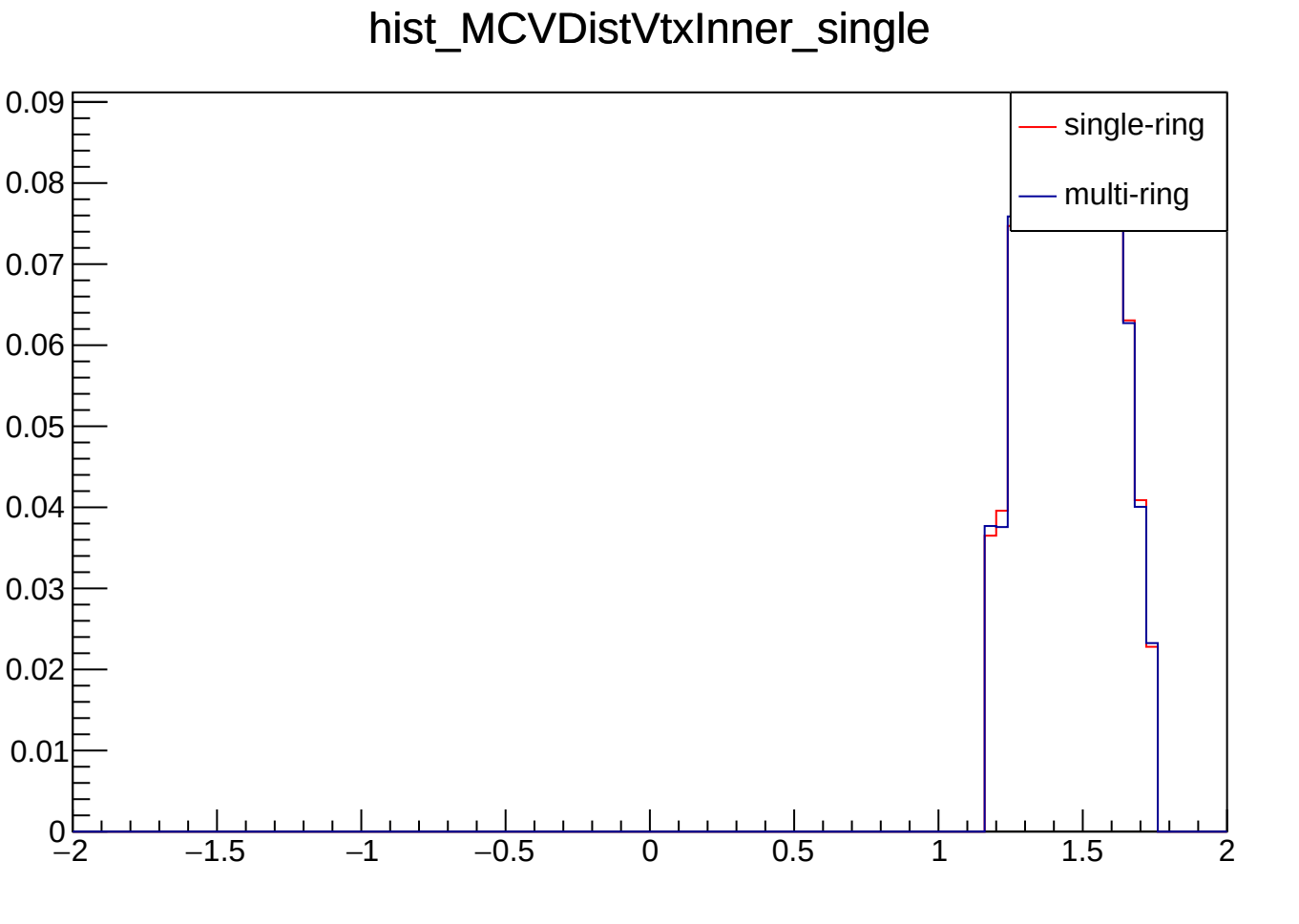

hist_MCTrueNeutrinoEnergy_single
single-ring
multi-ring
0.0025
0.002
0.0015
0.001
0.0005
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000

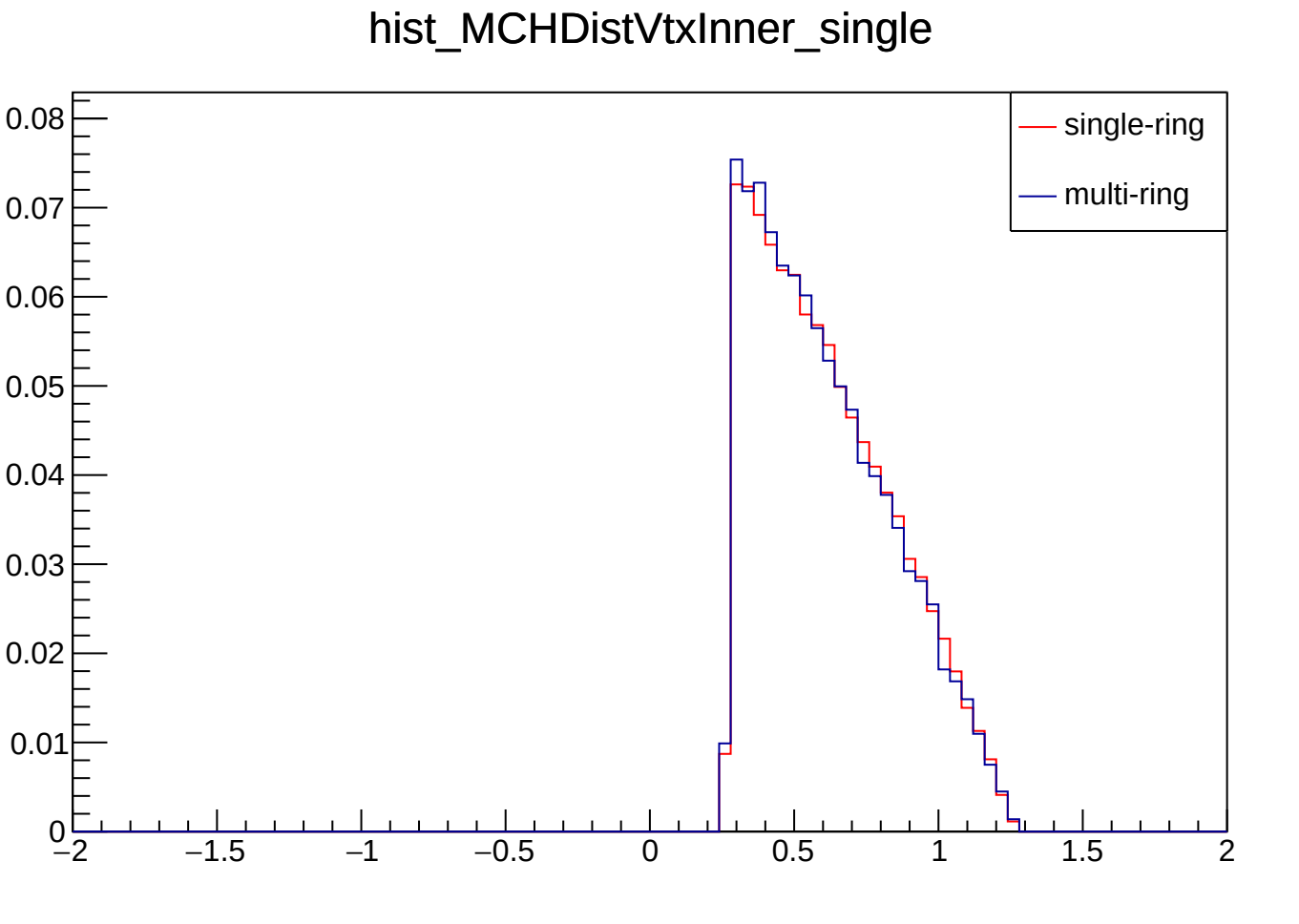

hist_EventNumber_single
single-ring
multi-ring
0.012
0.01
0.008
0.006
0.004
0.002
0
0
100
200
300
400
500
600
700
800
900
1000

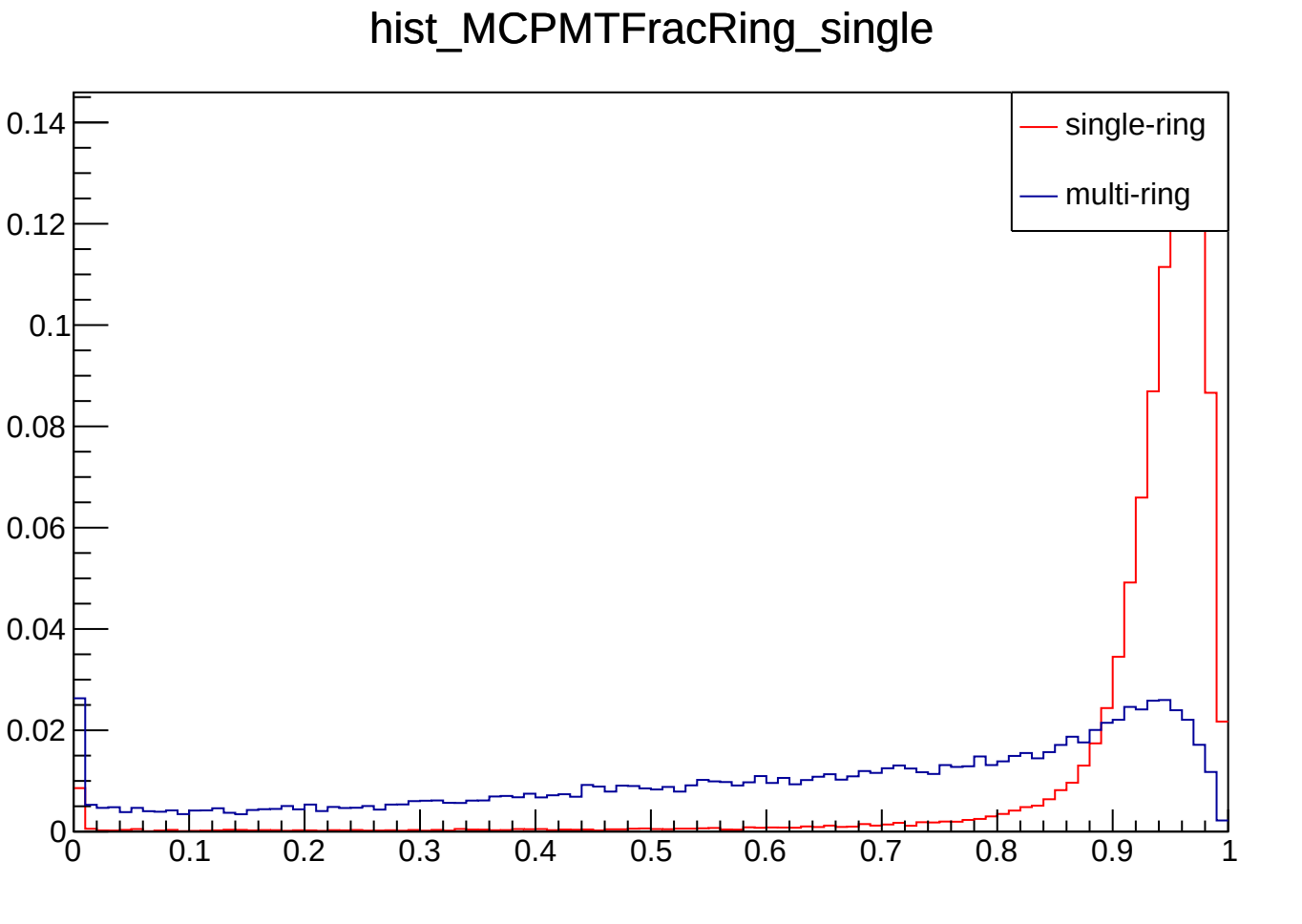

hist_MCNeutrons_single
single-ring
multi-ring
0.6
0.5
0.4
0.3
0.2
0.1
0
0
2
4
6
8
10
12
14
16
18
20

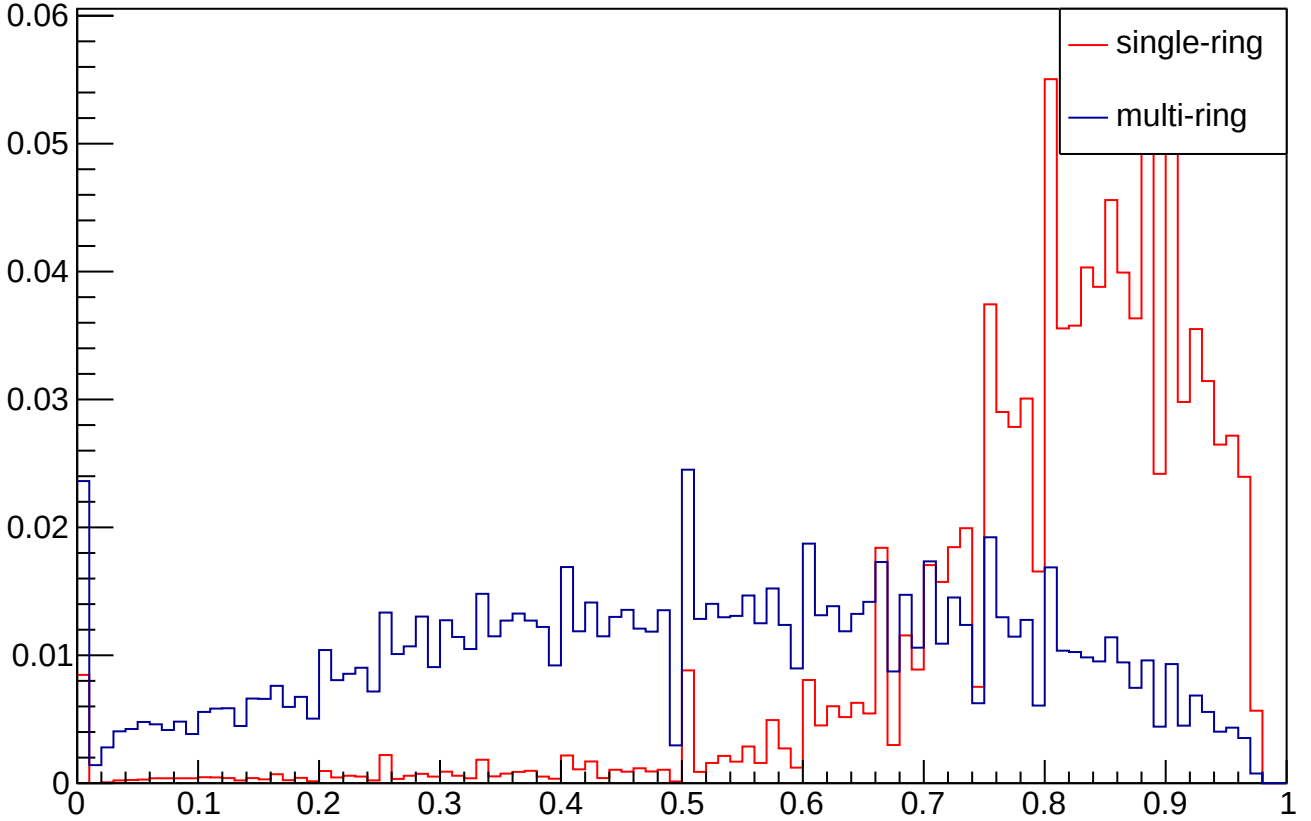

hist_MCVDistVtxWall_single
single-ring
multi-ring
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
0.5
1
1.5
2
2.5
3

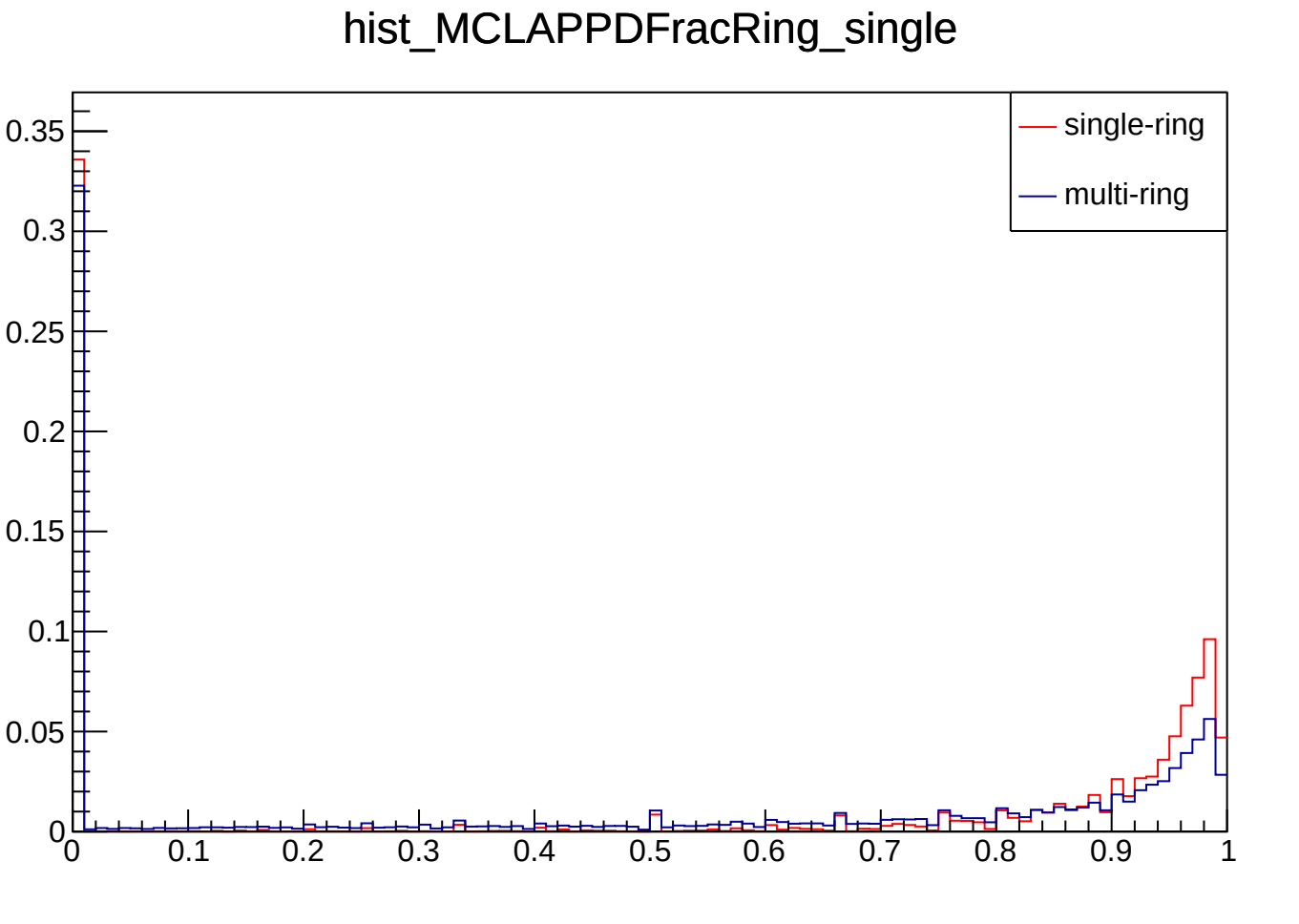

hist_MCHDistVtxWall_single
single-ring
multi-ring
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
−3
−2
−1
0
1
2
3

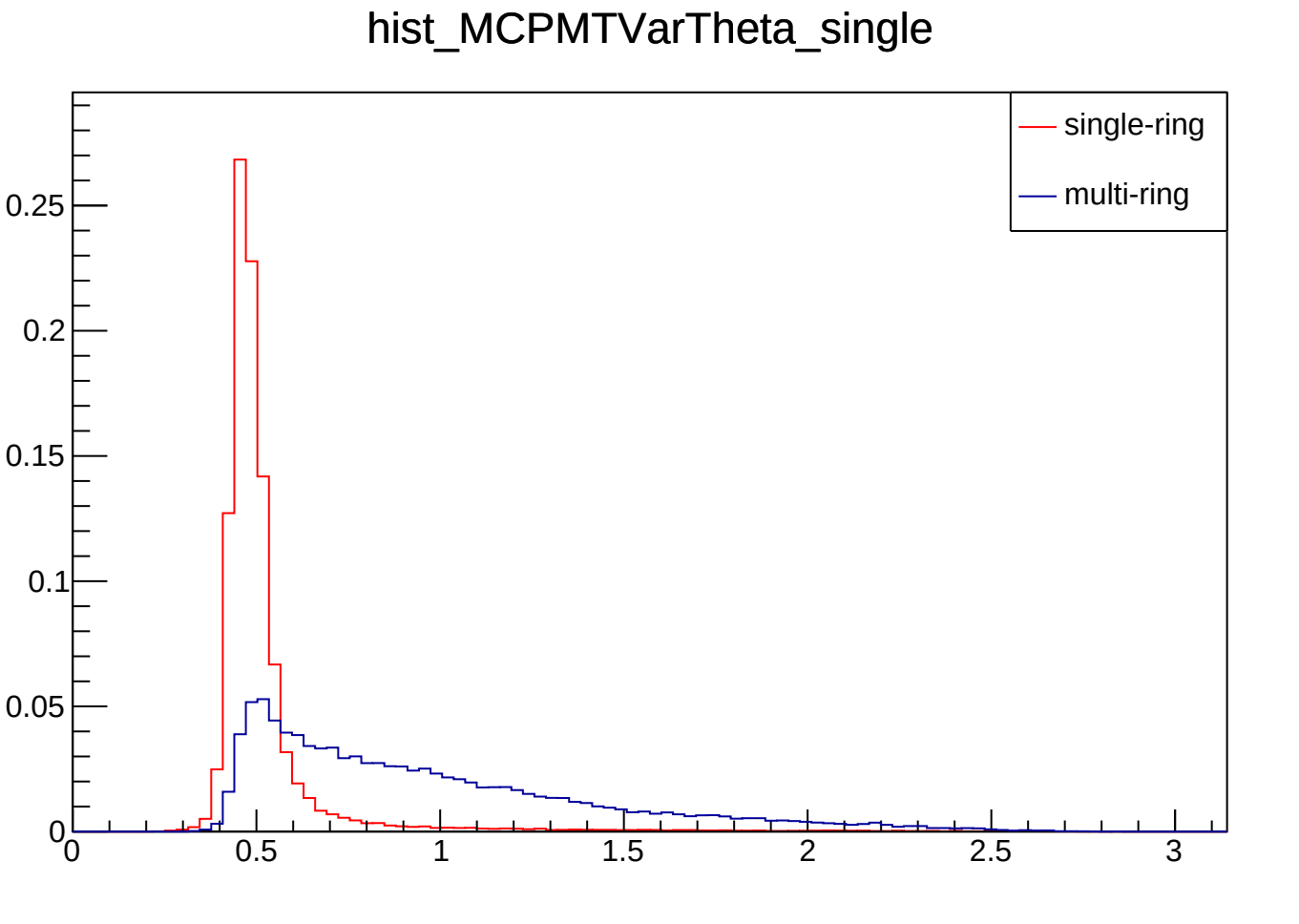

hist_MCVDistVtxInner_single
single-ring
multi-ring
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2

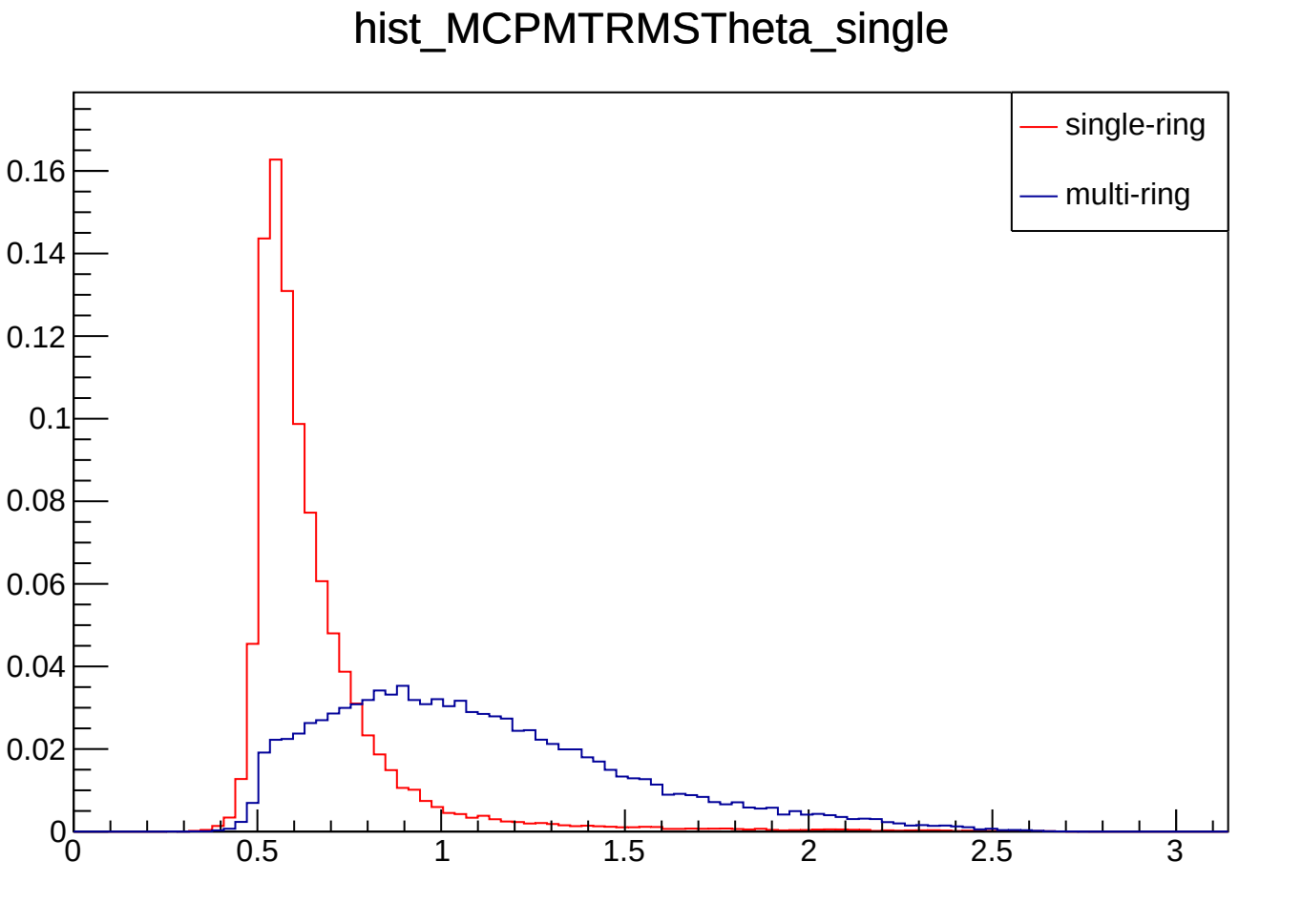

hist_MCHDistVtxInner_single
single-ring
multi-ring
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2

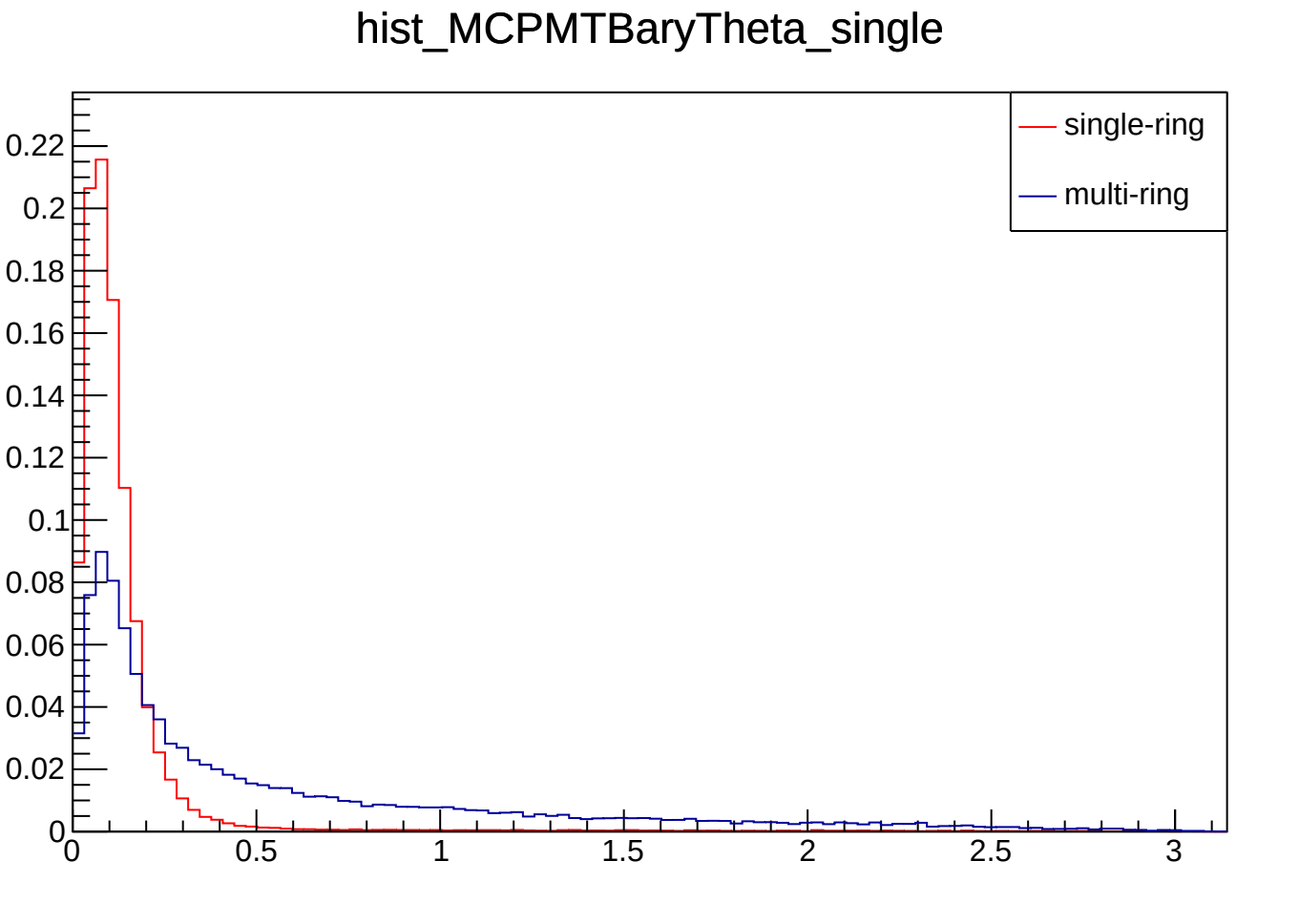

hist_MCPMTFracRing_single
single-ring
multi-ring
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

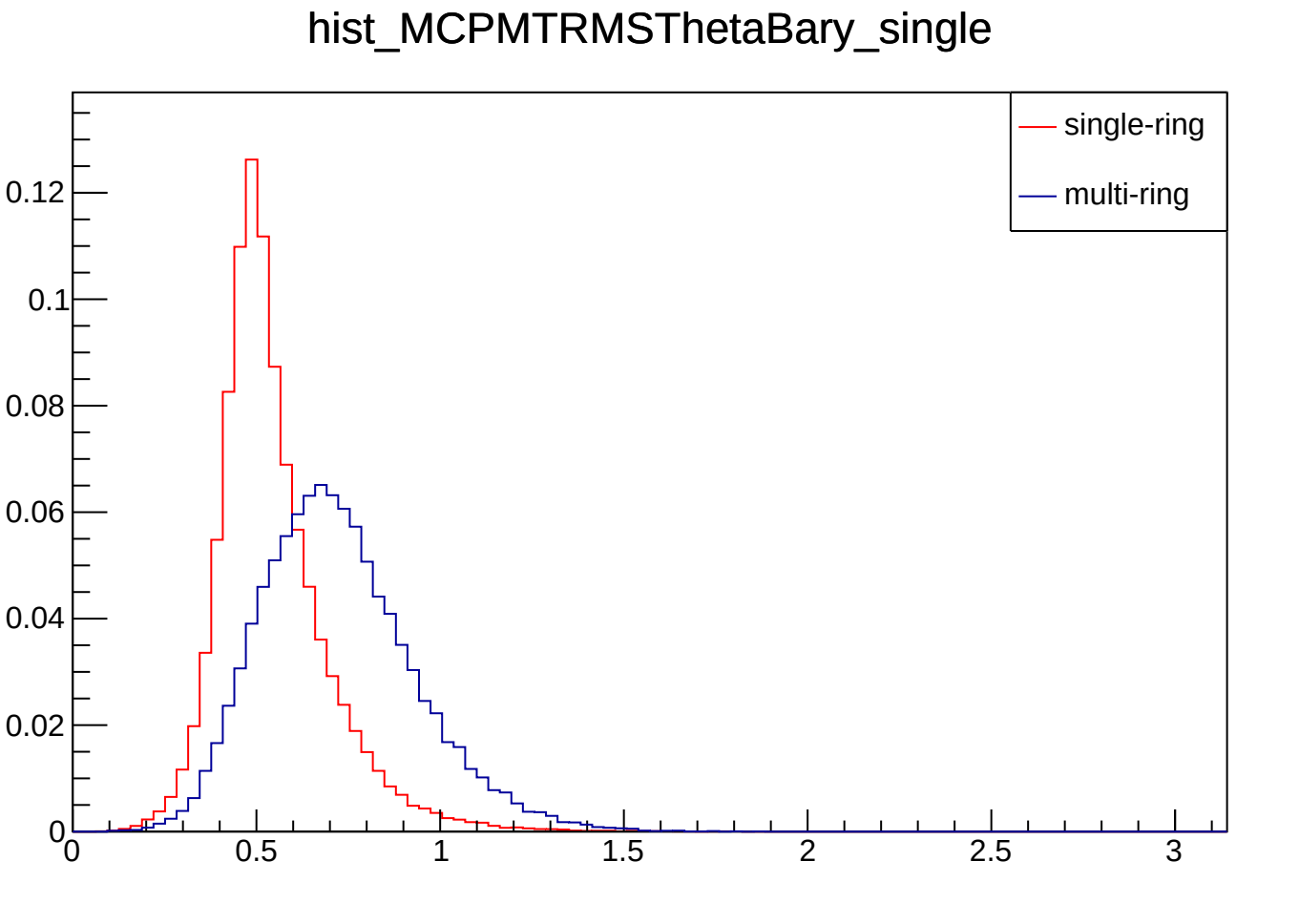

hist_MCPMTFracRingNoWeight_single
single-ring
multi-ring
0.06
0.05
0.04
0.03
0.02
0.01
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

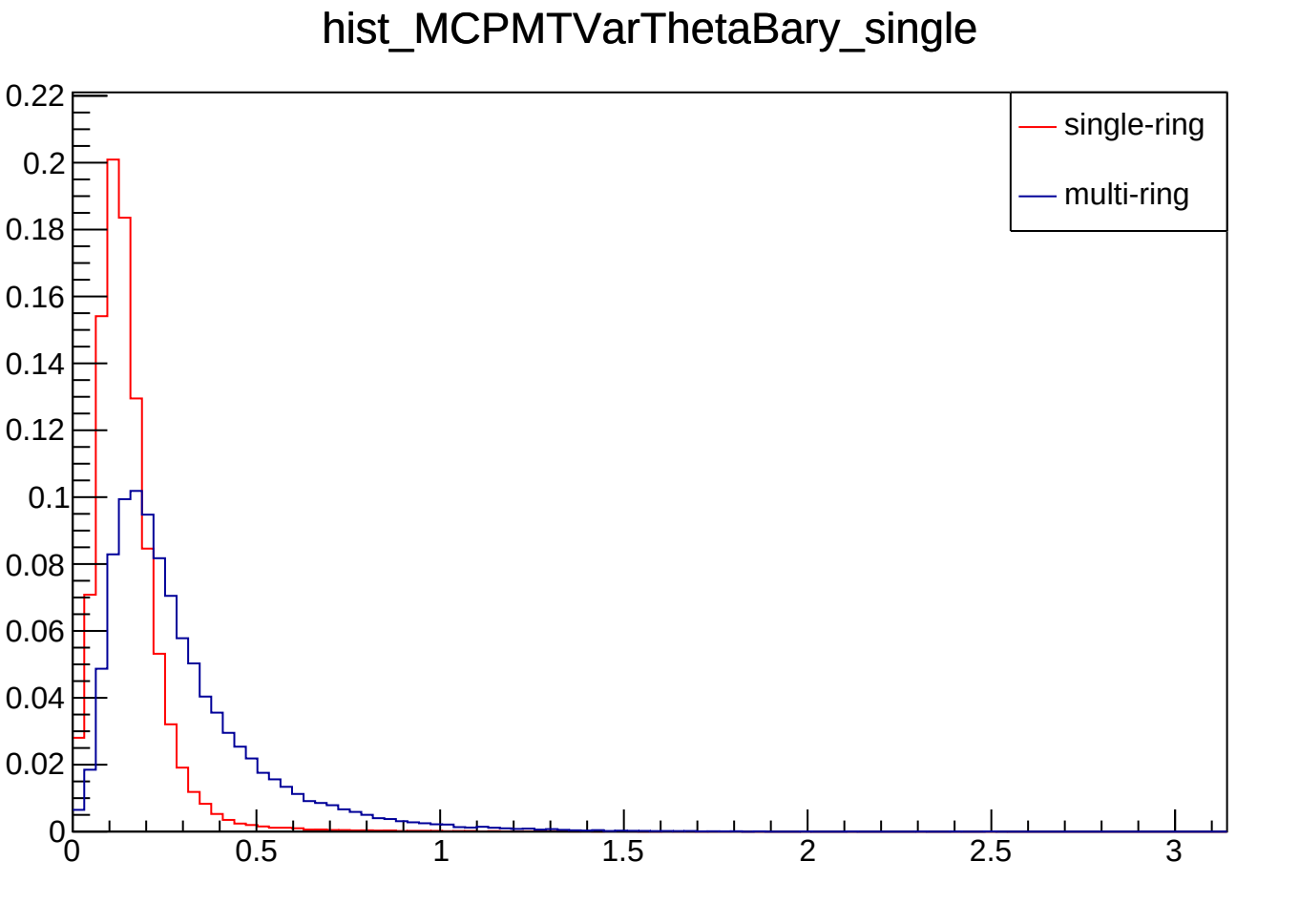

hist_MCLAPPDFracRing_single
single-ring
multi-ring
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

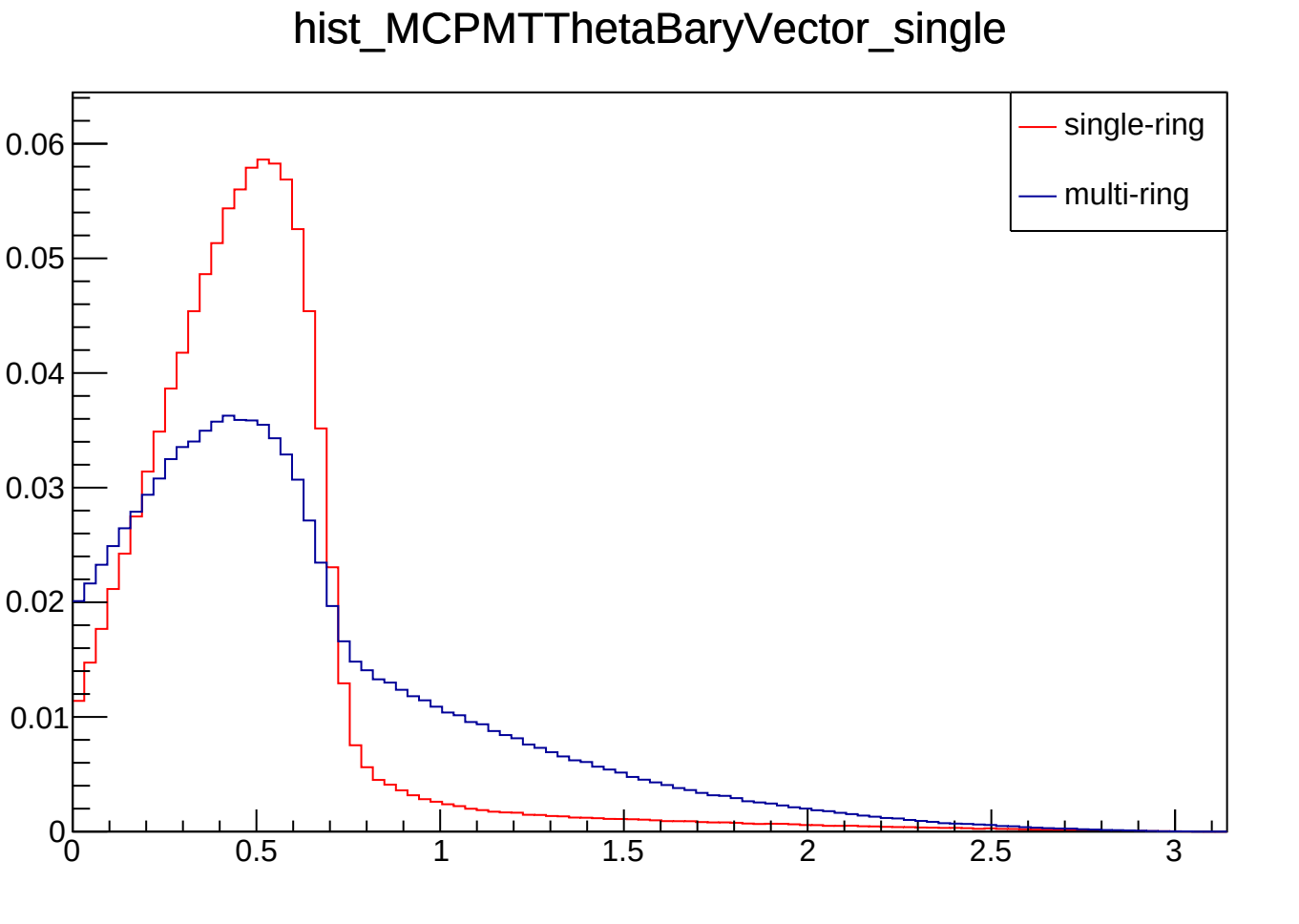

hist_MCPMTVarTheta_single
single-ring
multi-ring
0.25
0.2
0.15
0.1
0.05
0
0
0.5
1
1.5
2
2.5
3

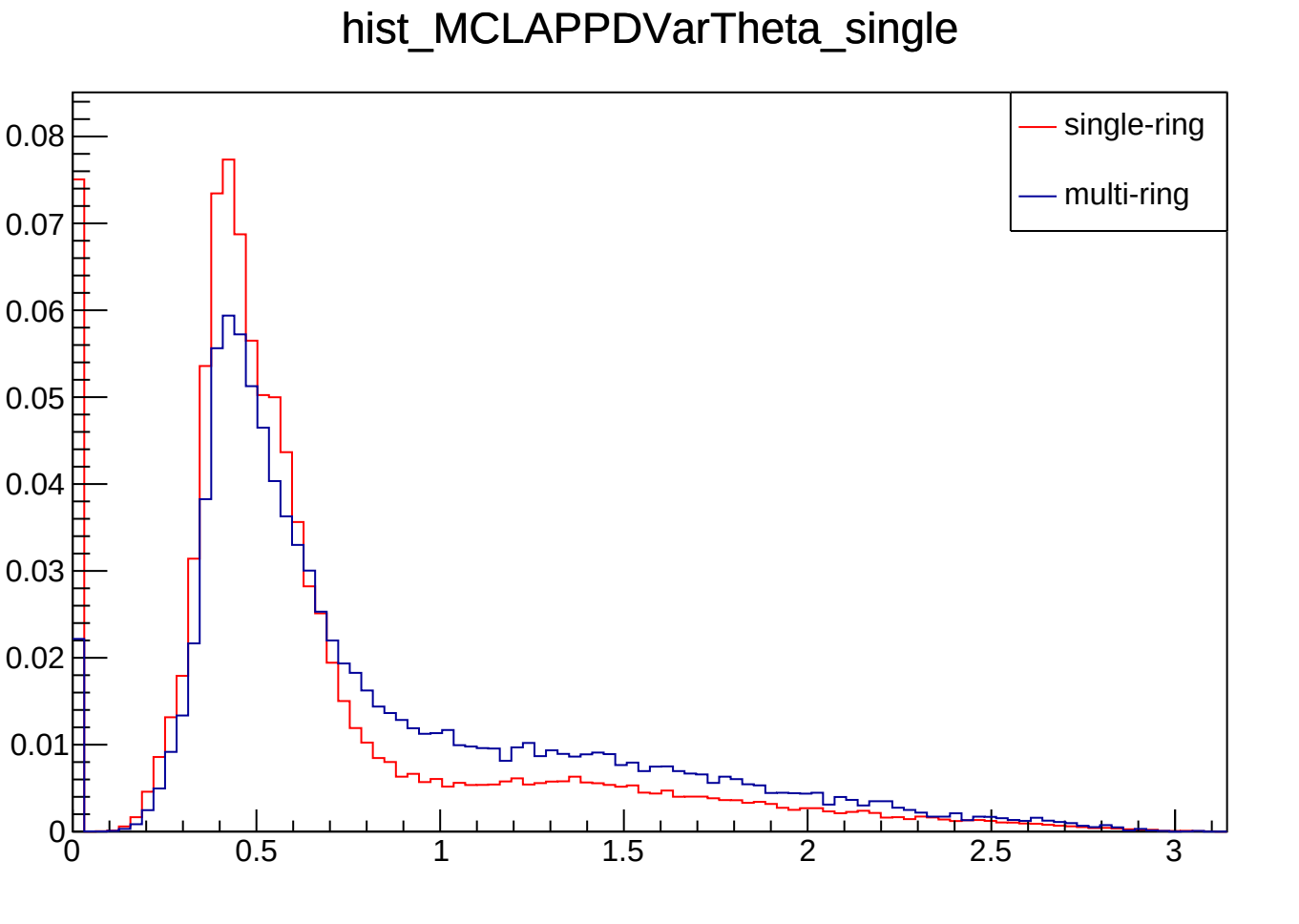

hist_MCPMTRMSTheta_single
single-ring
multi-ring
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3

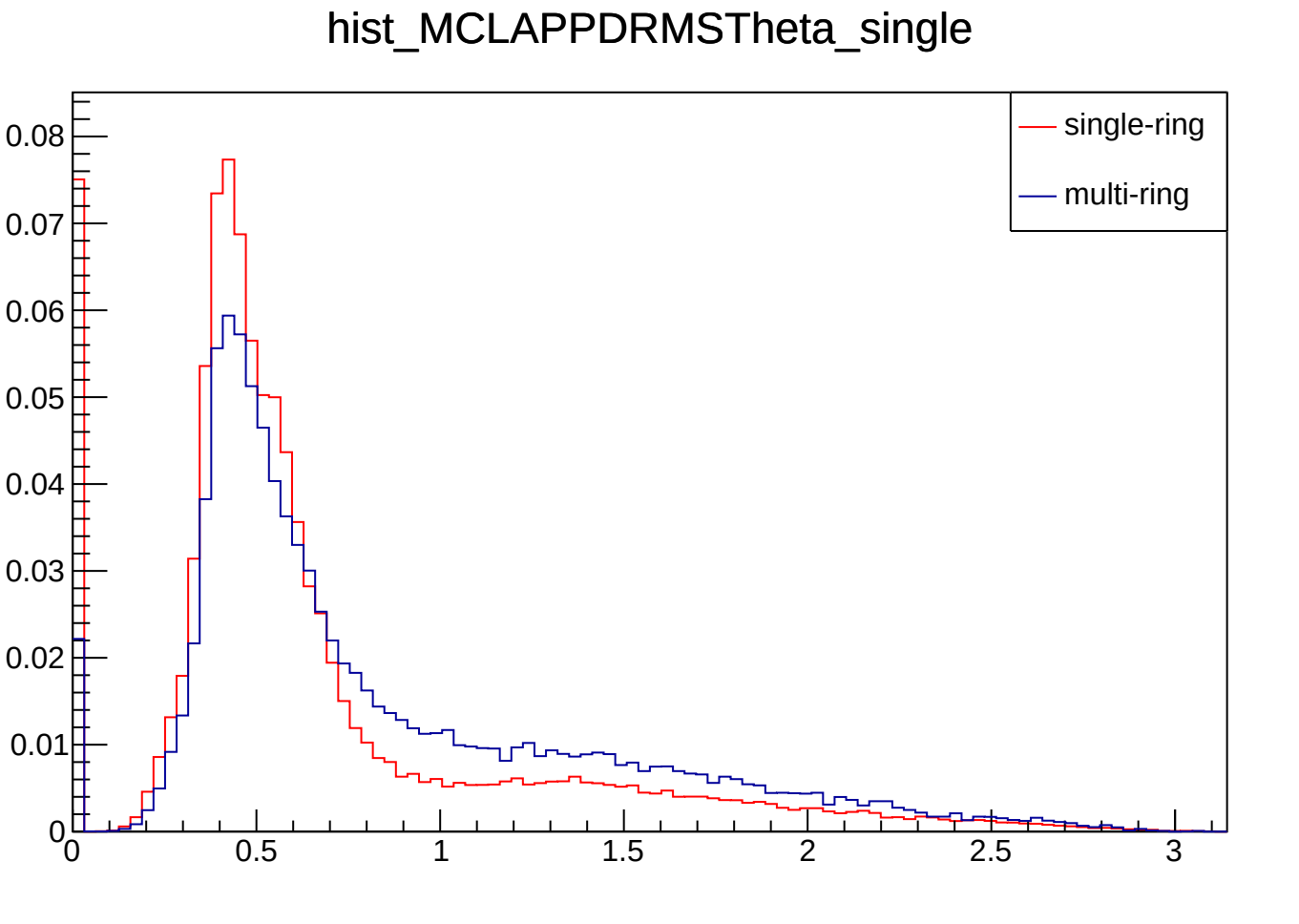

hist_MCPMTBaryTheta_single
single-ring
multi-ring
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3

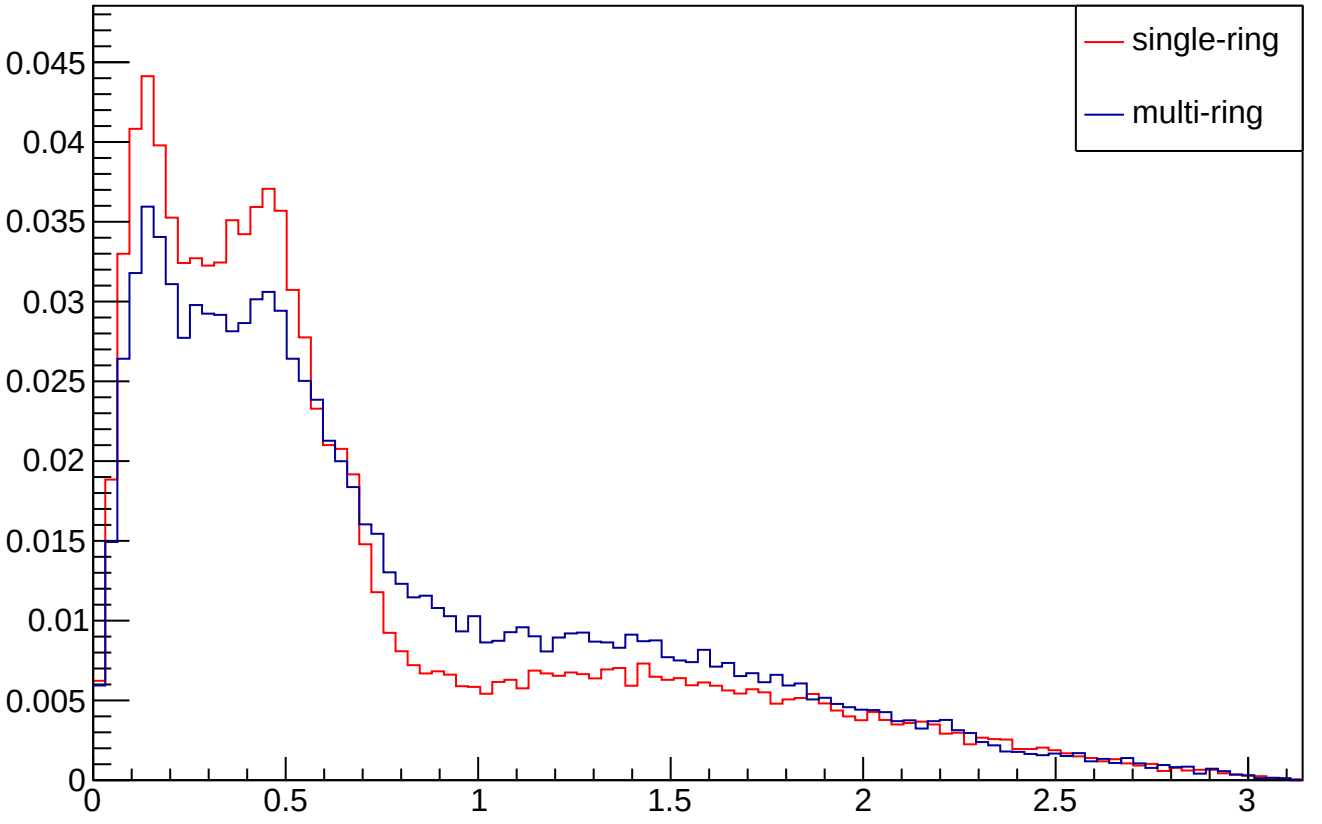

hist_MCPMTRMSThetaBary_single
single-ring
multi-ring
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3

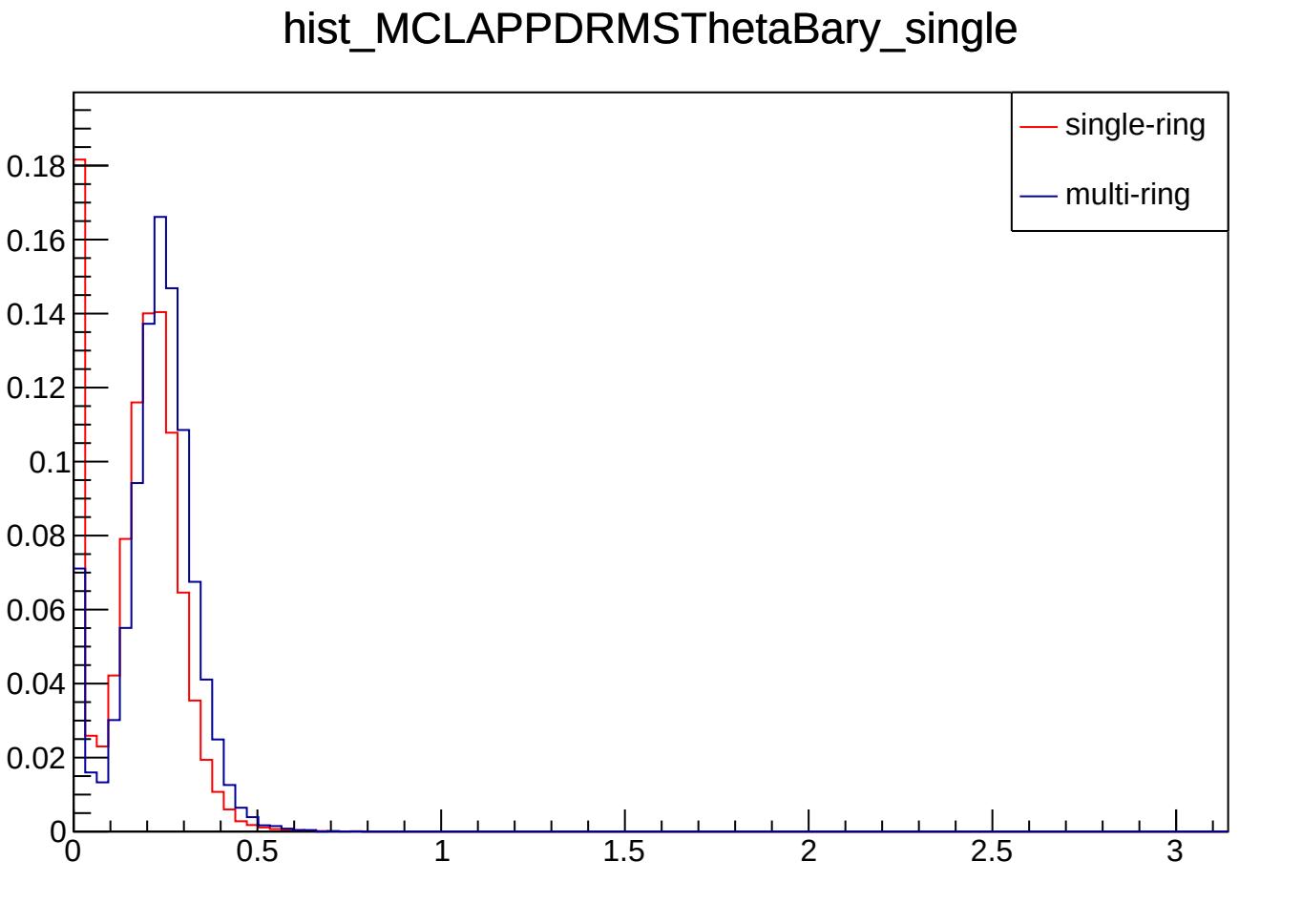

hist_MCPMTVarThetaBary_single
single-ring
multi-ring
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3

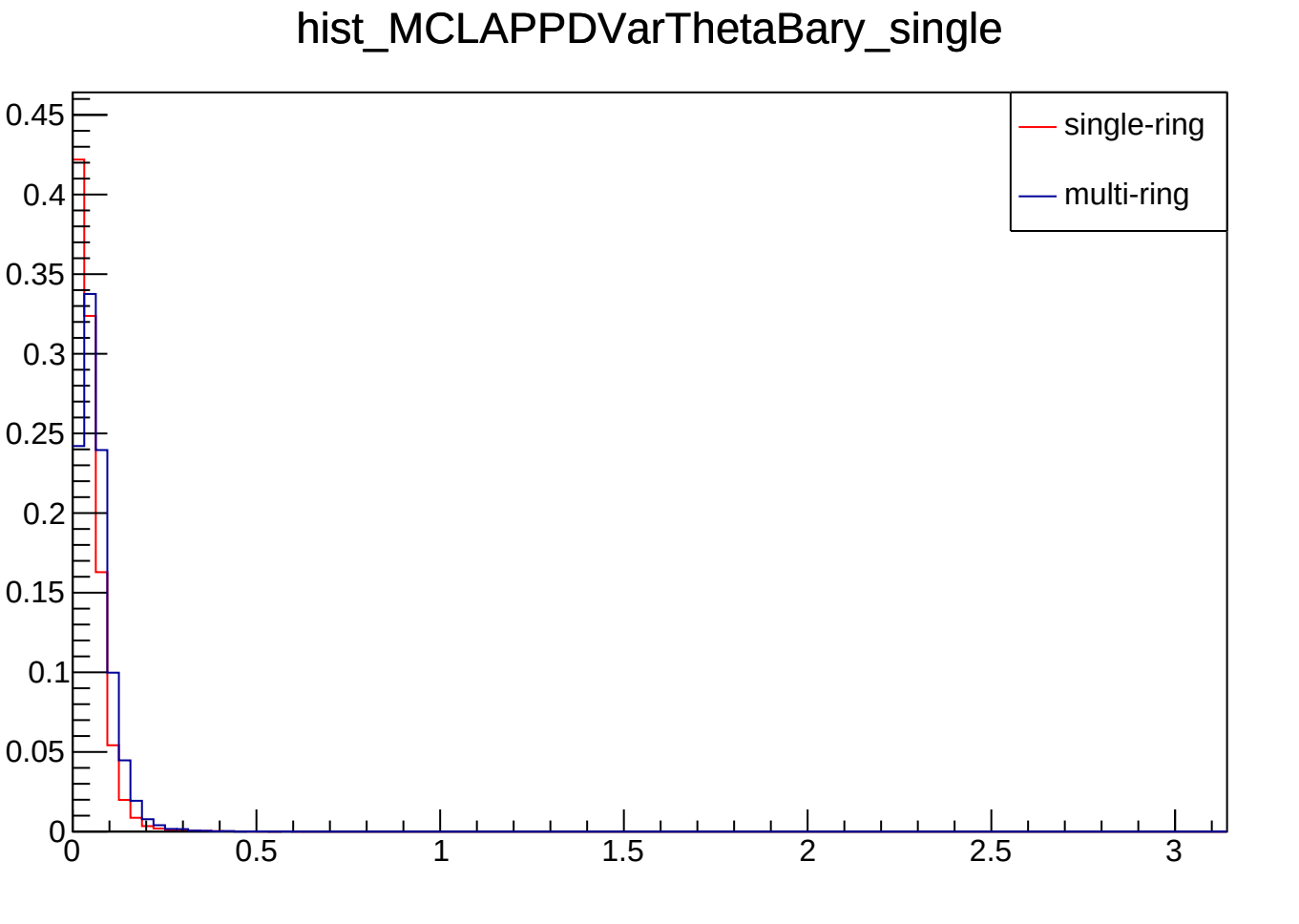

hist_MCPMTThetaBaryVector_single
single-ring
multi-ring
0.06
0.05
0.04
0.03
0.02
0.01
0
0
0.5
1
1.5
2
2.5
3

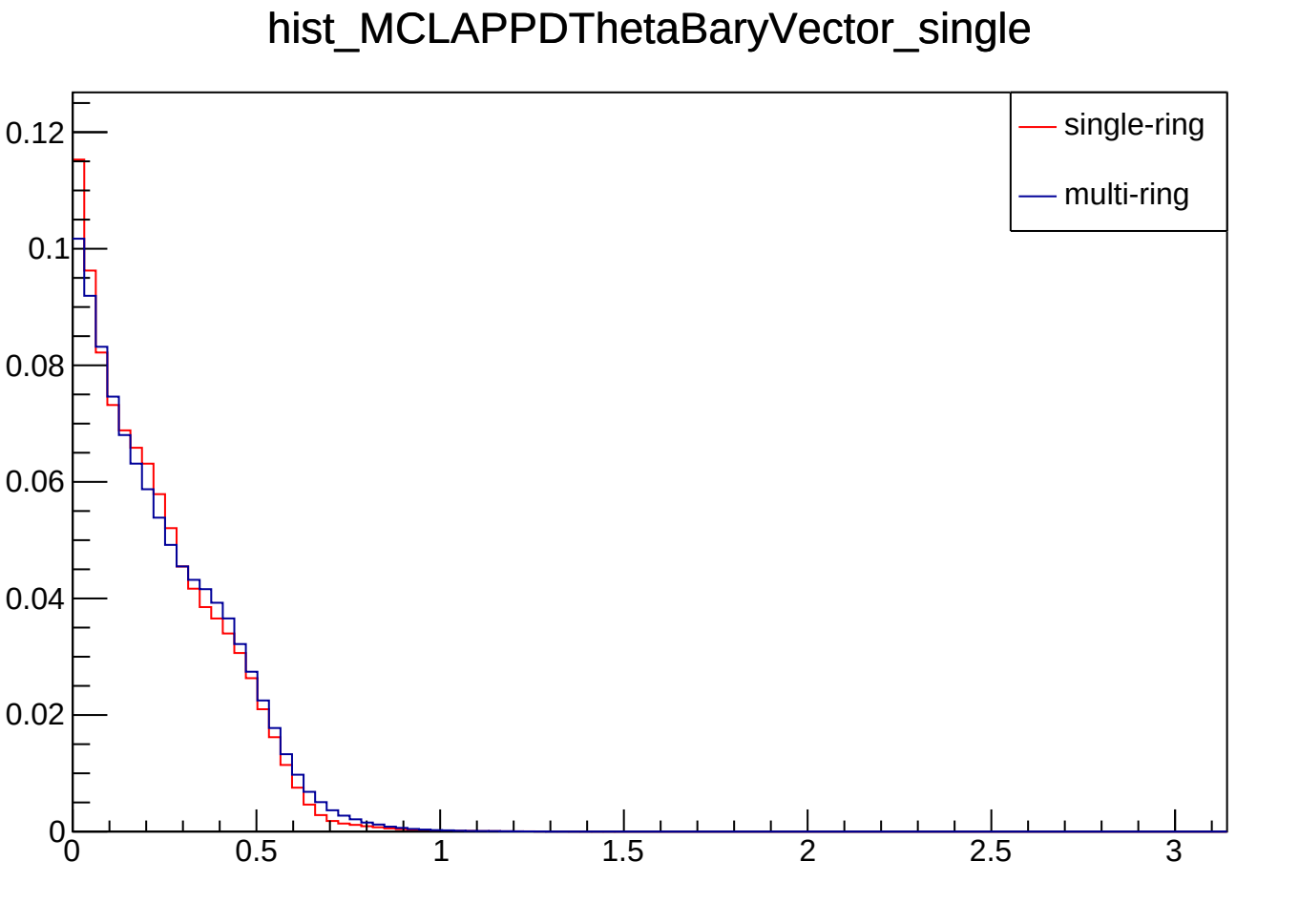

hist_MCLAPPDVarTheta_single
single-ring
multi-ring
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
0.5
1
1.5
2
2.5
3

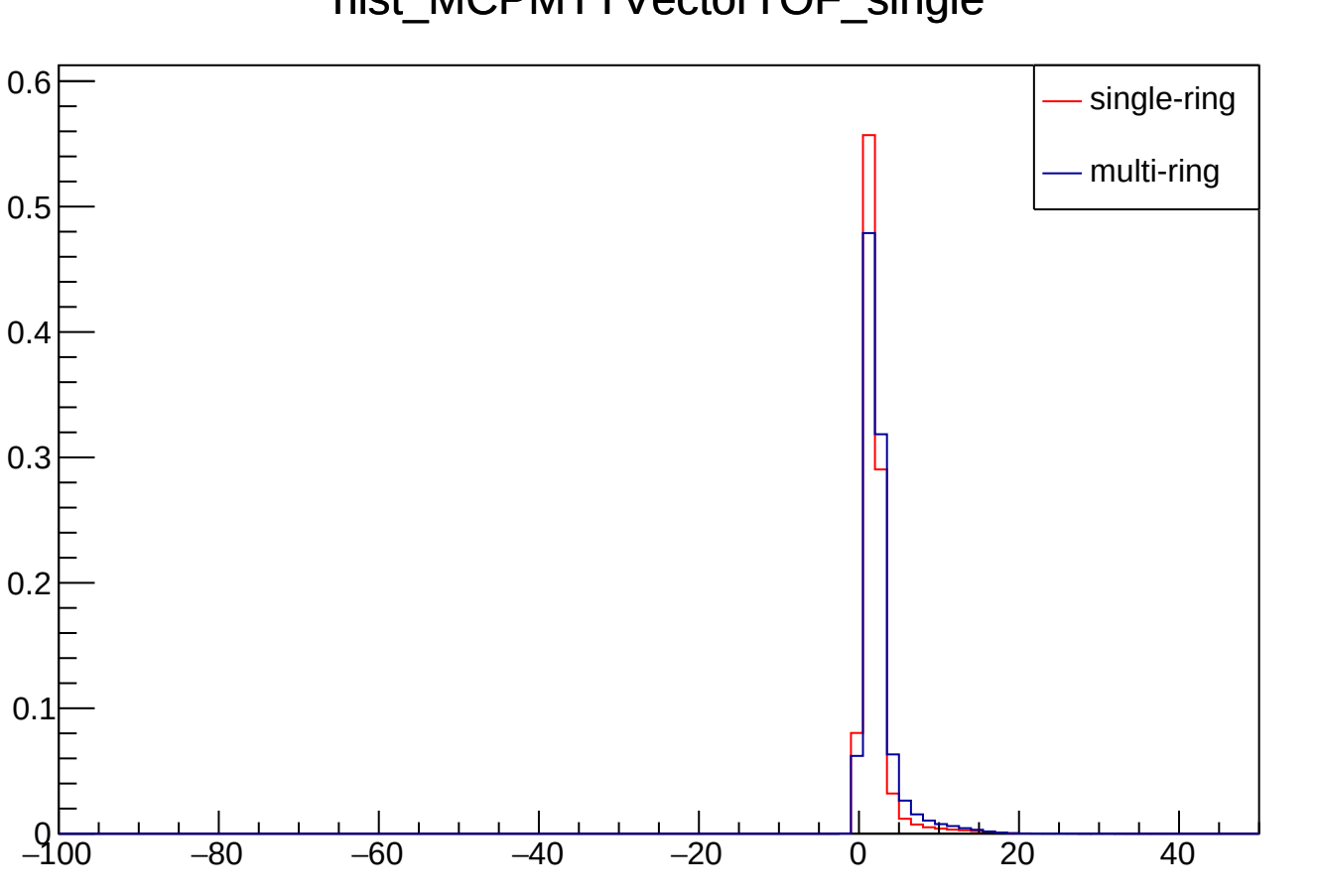

hist_MCLAPPDRMSTheta_single
single-ring
multi-ring
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
0.5
1
1.5
2
2.5
3

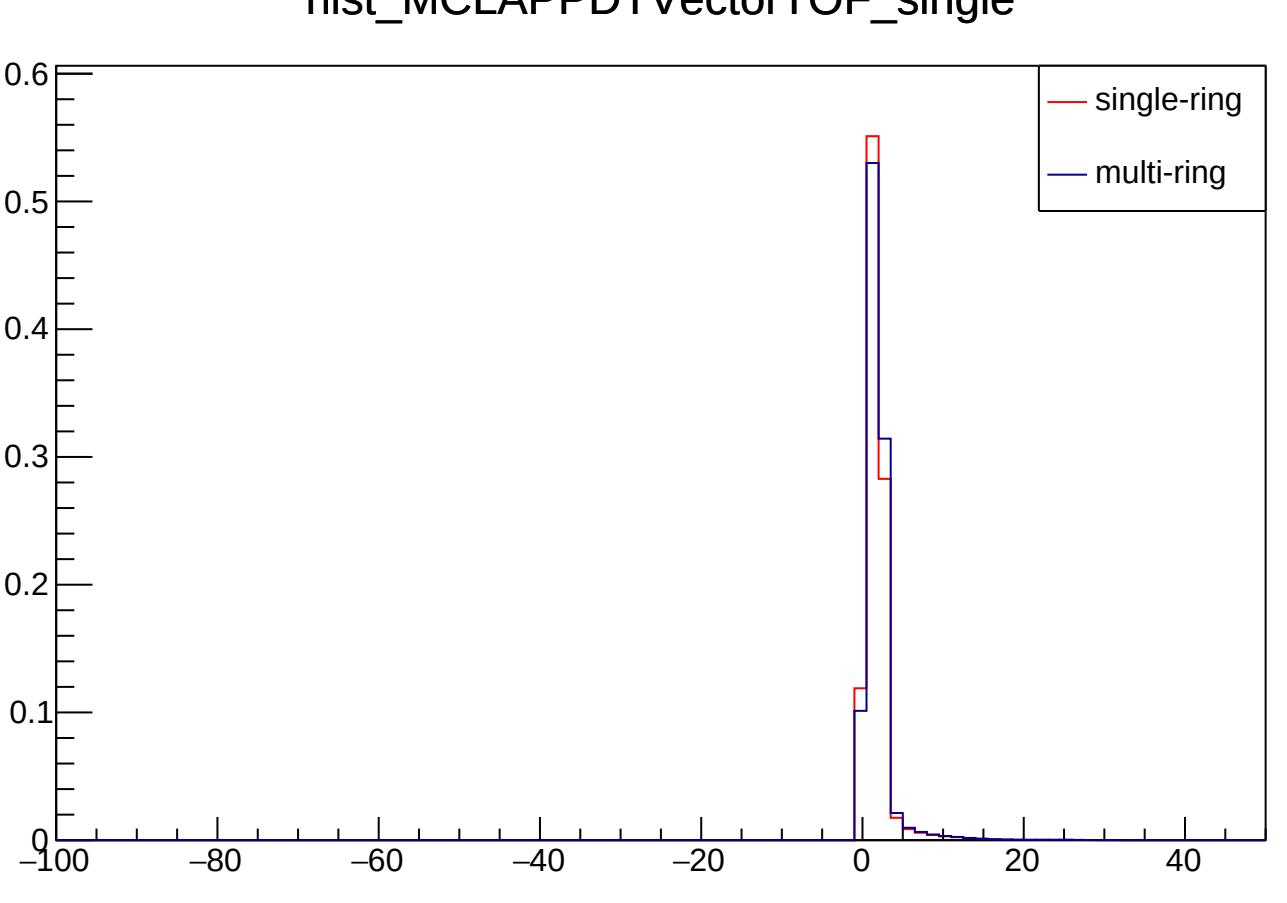

hist_MCLAPPDBaryTheta_single
single-ring
multi-ring
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
0.5
1
1.5
2
2.5
3

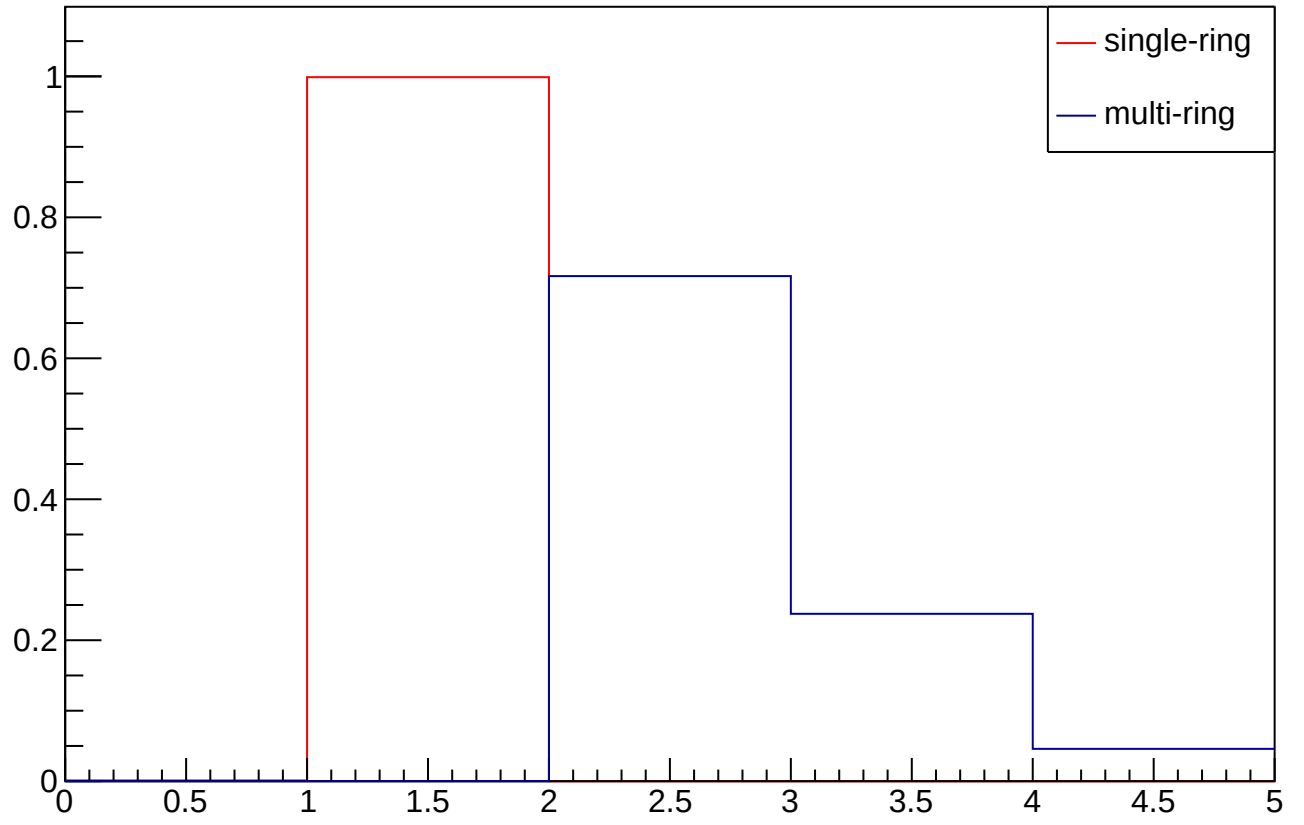

hist_MCLAPPDRMSThetaBary_single
single-ring
multi-ring
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3

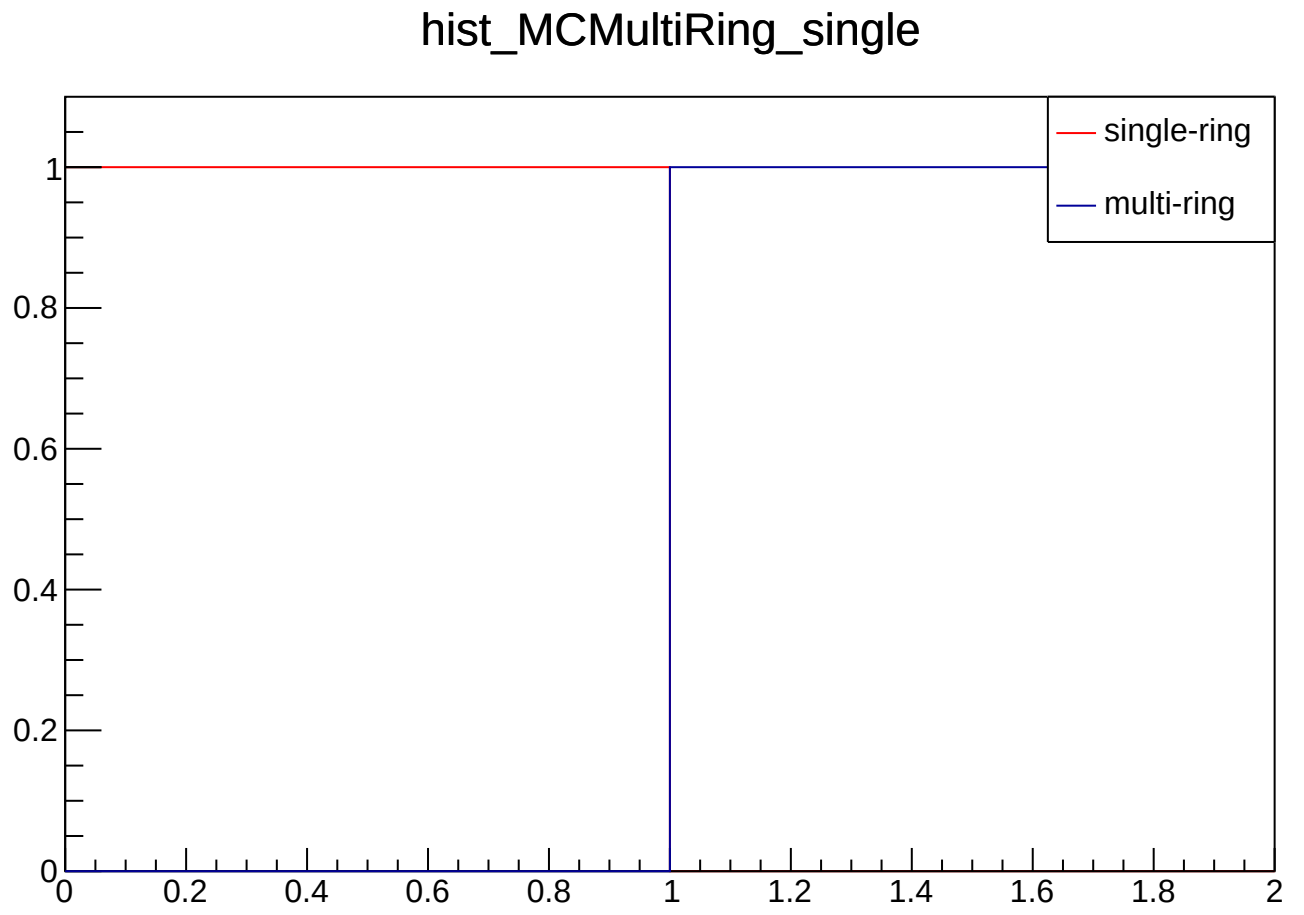

hist_MCLAPPDVarThetaBary_single
single-ring
multi-ring
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.5
1
1.5
2
2.5
3


hist_MCLAPPDThetaBaryVector_single
single-ring
multi-ring
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3


hist_MCPMTTVectorTOF_single
single-ring
multi-ring
0.6
0.5
0.4
0.3
0.2
0.1
0
–100
–80
–60
–40
–20
0
20
40


hist_MCLAPPDTVectorTOF_single
single-ring
multi-ring
0.6
0.5
0.4
0.3
0.2
0.1
0
–100
–80
–60
–40
–20
0
20
40


hist_MCNRings_single
single-ring
multi-ring
1
0.8
0.6
0.4
0.2
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5


hist_MCMultiRing_single
single-ring
multi-ring
1
0.8
0.6
0.4
0.2
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2